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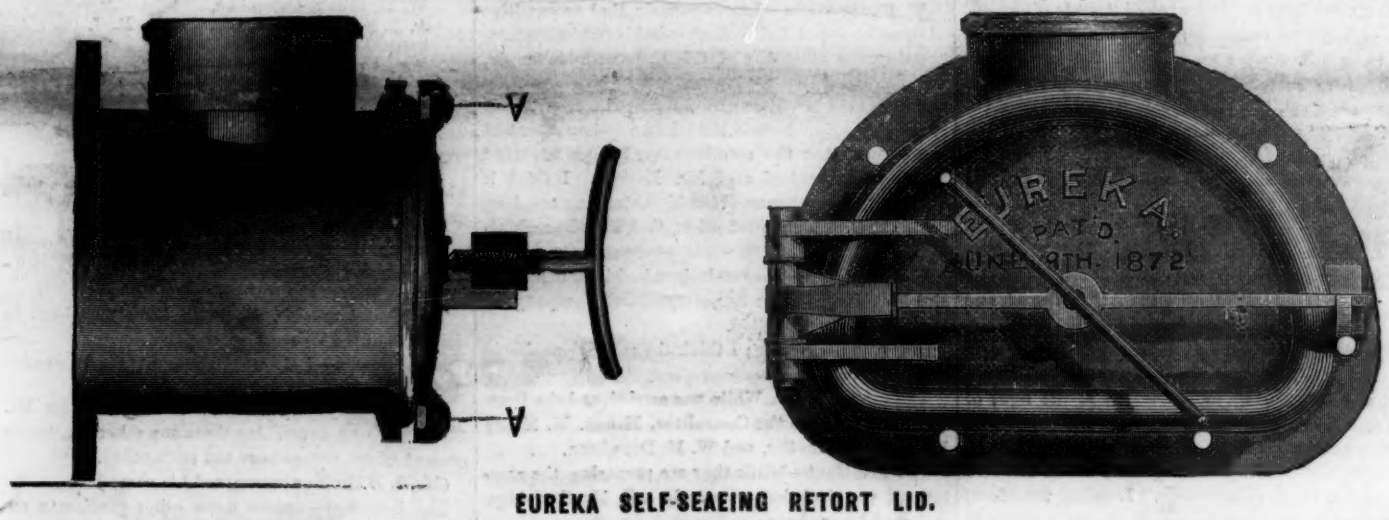
Eureka Self-Sealing Retort Lid.

DIETRICH and SCHUESSLEY'S Patent.

PATENTED JUNE 18, 1872.

The necessity which has so long existed for some *self-sealing* retort lid. to obviate the use of luting in gas works, has been entirely overcome by the use of the Patent Eureka Self-Sealing Lid, so simple in its construction and complete in its working, that any gas company can adopt it without other expense than the lid itself. It can be attached to any shaped mouth piece, and put on without disturbing the heat of the retort.



EUREKA SELF-SEAEING RETORT LID.

The Eureka Lid is now in successful operation at the works of the New York Gas-Light Company, the Boston Gas-Light Company, and Philadelphia Gas-Light Company, giving entire satisfaction.

It is manufactured solely by HERRING & FLOYD, Oregon Iron Foundry, Nos. 738, 740, 742 and 744 Greenwich street, N. Y., to whom all orders or communications may be addressed.

Water-Supply and Sewerage in Great Britain.

The London *Journal of Gas-Lighting* makes the following comments on water-supply and sewerage in Great Britain. Many of their words might be with great fitness repeated and applied to this country. It certainly seems that the "sewage farms" are not yet demonstrated to be a sovereign remedy for all the ills and inconveniences resulting from a system of sewerage:

"If sanitary progress is to be measured by the debts incurred by local authorities for what are called sanitary works, we have undoubtedly made great advances within the last ten years. A report, just presented to the Local Government Board, by Mr. J. Simon, informs us that, from 1864 to 1870, the loans contracted by local authorities for permanent works mainly sanitary, averaged £692,000 a year. Thence, to the end of 1872, the annual average exceeded £844,000, and, in the last two years, the amount has reached a million and a million and a-half. It is not alleged, and we believe it could not be maintained, that this outlay of money has at present made any impression on the death-rate of the country, nor even of the districts on which the money has been spent. So far, however, as the expenditure has been incurred, in providing an adequate supply of good water, it must be approved, and benefit is certain to result. As regards sewerage works, it is impossible to say so much. Without alleging anything against them, we may express an opinion that their value, in a sanitary point of view, has yet to be proved. Most certainly the five millions we have expended in this metropolis have not yet diminished the death-rate, which remains obstinately the same as it was before the Board of Works came into existence, and our main drainage system was commenced.

It must not, however, be supposed that we deprecate the expenditure of money on sewerage works. What we have endeavored to inculcate is, that sewerage is not to be considered the be-all and end-all of sanitary work. It is not very certain, as Mr. W. B. Greg says, that we are, as yet, on the right track with regard to sanitary matters, and all we contend for is continued unprejudiced observation, and careful ratiocination. We protest against the blind adherence to the dogma of the day, and should be glad to see a more independent tone assumed by our sanitary inspectors. In the absence of this, and of better light, we must continue to counsel local authorities to reflect before they incur debts for so-called sanitary improvements, and, above all, just now, to wait. If by-and-by they are urged to large expenses, they will have a stronger claim on that portion of a surplus which Mr. Greg devoutly wishes to see expended on sanitary experiments."

A Beautiful Experiment in Instantaneous Crystallization.—Peligot.—Dissolve 150 parts by weight hyposulphite of soda in 15 parts boiling water, and gently pour it into a tall test glass so as to half fill it, keeping the solution warm by placing the glass in hot water. Dissolve 100 parts by weight sodic acetate in 15 parts hot water, and carefully pour it into the same glass, the latter will form an overlying layer on the surface of the former, and will not mix with it. When cool, there will be two supersaturated solutions. If a crystal of sodic hyposulphide be attached to a thread and carefully passed into the glass, it will traverse the acetate solution without disturbing it, but, on reaching the hyposulphite solution, will cause the latter to crystallize instantaneously in large rhomboidal prisms with oblique terminal faces. When the lower solution is completely crystallized, a crystal of sodic acetate similarly lowered into the upper solution will cause it to crystallize in oblique rhomboidal prisms. The appearance of the two different kinds of crystals will not fail to astonish those not acquainted with this class of experiments.—*Nature.*

Third Annual Meeting of the American Gas-Light Association.

HELD AT MASONIC TEMPLE, NEW YORK, OCTOBER 20TH, 1875

At 10 A. M., the Association was called to order by the President, General Charles Roome, who, on taking the chair, said:

Gentlemen of the Association:

I must make the same apology to you now that I did before; that it has not been in my power to prepare an address such as would be proper to submit to you.

During the past summer I was in very poor health, unable to attend to business of any kind, and was obliged to be absent. Since my return, which has only been for a few weeks, I have been so completely absorbed in matters of business connected with my own company, and my health has been so extremely feeble, that it was with the utmost difficulty I attended to those duties which were required of me, but still I bid you heartily welcome here.

We are now assembled for the purpose of deliberating again on matters connected with the interests of the profession in which we are engaged.

It is unnecessary for me to remind you of the obligations you are under to those whose interests you represent, and to the public at large.

This is an interest embracing the whole country. We meet here from Canada to Florida, from Maine to California. We are here for the purpose of duly deliberating and carefully considering matters which may be presented to us, which are calculated to advance the welfare and usefulness of those institutions over which we preside, and which we represent. Therefore, let us take these matters calmly, considerately, deliberately.

We are not here to advance the interests of any one man, or any one company; but we are here to tell each to the other what we know of the business in which we are engaged, which is calculated to advance the general good, and promote harmony between the manufacturer and the consumer.

There is nothing in our business, with which I am acquainted, after an experience of forty years, that we need make a secret of, which all the world may not know. Startling discoveries are not to be expected. Little by little do we advance, and advancing little by little we make sure progress.

Therefore should we be calm and self-possessed, and give a due measure of consideration to improvements, or supposed improvements, calling upon each man who rises here to give a reason for that which he asserts, and considering those reasons in the light of truth and conscience. For our business is a business of truth and conscience. If, then, we consider it in that light, our annual gathering will be most valuable to us and to those we represent. Leaving, therefore, the matter in your hands, we will at once proceed to business. (Applause).

I have been requested by the Trustees of this building, known as Masonic Hall, to invite you all to go through it tomorrow afternoon. The elevator will then be ready and you will be conducted through the building. And, if after seeing this abode of masonry, you can become Freemasons, then you will probably learn more about it than I know myself. (Applause.) Furthermore, I am requested by the President of the Safe Deposit Company, which is located in this building, on 23d Street, to invite you through their establishment at any time during the day, from 9 o'clock in the morning until 5 o'clock in the afternoon, and to say that if any of you wish to write letters, you will have such facilities afforded you there, as will not be afforded you here; and, if you go there, you will find that that institution, like masonry, is founded on a rock. (Applause.)

Mr. Neal--It is usual, after a meeting of this kind has assembled and organized, for the record of the previous meeting to be read. That is a good deal of trouble, and will take up much of our time, and I therefore move that the reading of the minutes of the last meeting be dispensed with. Carried.

The President—The next business in order, according to our constitution and by-laws, is to receive and consider all applications and recommendations for membership; now is the proper time for it, and facilities are afforded at the table on my left.

The Secretary then read a list of names of applicants for membership in the association, and stated that the applications are all properly endorsed as required by the constitution and by-laws.

A member—I should like to inquire if each application is endorsed.

The Secretary—Every one, sir.

A member—I had the impression that one was not.

The Secretary—One was not; but I omitted it from the list.

Those desiring to become members then came forward and signed the regular form of application. This occasioned considerable delay, and while the necessary papers were being made out, the President said:

Gentlemen of the Association: It becomes my painful duty to announce to you the death of Mr. Cornelius Everett, President of the New York Gas-Light Company. He is to be buried this afternoon.

I have known Mr. Everett for many years. He was a gentleman of eminent worth, a sincere Christian, an upright, honorable man. He was a *man* in the fullest acceptation of that term, and a virtuous, amiable, lovable gentleman. I hope that before the morning hour expires, some gentleman will prepare resolutions suitable to be adopted by the members of this Association. He is to be buried from his residence, on the Second Avenue, the number I have forgotten.

A member—105.

The President—105 Second Avenue, at half past one o'clock. The Association will, therefore, take such action as it may deem necessary.

W. Henry White—I move you, sir, that a committee of three be appointed to draft suitable resolutions, expressing the sympathy of this body with his family, and also expressing the high esteem in which this Association held Mr. Everett. I would also respectfully suggest that the Association take an adjournment at one o'clock, that the members may be able to attend the funeral ceremonies of Mr. Everett. I think it but due to a gentleman of his high standing and long connection with our profession, that we take such action.

The President—The resolutions had better embrace also Mr. Miles, former Secretary of that Company, he having also recently died.

Mr. White—Yes, sir; I think the resolutions should also embrace him.

The motion of Mr. White was carried, and the President appointed as the Committee, Messrs. W. Henry White, O. Zollikoffer, and W. H. Denniston.

The President—While they are preparing the resolutions, you had better call the roll, Mr. Secretary, and see who are here.

The Secretary—I had intended to have a book in which each gentleman could write his name; but I have had so many things to attend to that I forgot it, and I will have to call the roll from the list printed in the book I hold, but hereafter I will have a book, so that in it, as he comes into the meeting, each member can write his name.

The roll was then called, and the following members were present:

W. W. Goodwin, Phila., Pa.
W. W. Beggs, San Francisco, Cal.
Henry Cartwright, Phila., Pa.
L. C. Hanford, Norwalk, Conn.
F. E. Harrison, New Haven, Conn.
Jno. P. Harbison, Hartford, Conn.
C A. Gerdenier, Bridgeport, "
T. E. Littlehales, Hamilton, Canada.
J. W. Gates, " "
Thos. Curley, Wilmington, Del.
E. Betts, " "
H. Stacey, Indianapolis, Ind.
Wm. Dunbar, New Albany, Ind.
J. Lawrence Smith, Louisville, Ky.
E. M. Breese, Detroit, Mich.
H. H. Edgerton, N. Y. City.

J. H. Rollins, Worcester,	Mass.
Geo. D. Cabot, Lawrence,	"
H. F. Coggshall, Fitchburg,	"
George B. Neal, Charlestown,	"
George Dwight, Springfield,	"
O. E. Cushing, Lowell,	"
L. D. Rhodes, Holyoke,	"
F. H. Odiorne, Boston,	"
T. J. Pishon, Roxbury,	"
L. P. Gerould, Newton,	"
Isaac R. Scott, Waltham,	"
Gen. Chas. Roome,	New York City.
J. R. Floyd,	"
O. Zollikoffer,	"
I. Herzog,	"
H. P. Allen,	"
Chas. Nettleton,	"
Geo. Olney,	"
J. Elliot Condict,	"
Chas. W. Isbell,	"
Jno. Balmore,	"
Edwin Ludlam,	Brooklyn, N. Y.
T. F. Rowland,	"
J. W. Beatley,	"
W. H. Bradley,	"
I. N. Stanley,	"
W. Henry White,	"
C. White,	"
James How,	"
A. C. Wood, Syracuse,	New York
O. G. Steele, Buffalo,	"
Wm. Cartwright, Oswego,	"
G. T. Sutton, Peekskill,	"
T. C. Cornell, Yonkers,	"
W. R. Beal, Mott Haven,	"
Isaac Battin, Albany,	"
H. A. Brooke, Albany,	"
J. S. Chambers, Trenton,	New Jersey.
W. L. Williams, Paterson,	"
T. C. Bates, Hoboken,	"
N. B. Crenshaw, Millville,	"
Marcus Smith, Wilkes Barre,	Pennsylvania.
W. H. Denniston, Pittsburgh,	"
Wm. Gardner, "	"
P. Munzinger, Philadelphia,	"
J. Desha Patton, Trevorton,	"
Geo. K. Reed, Lancaster,	"
W. H. Price, Cleveland,	Ohio.
W. H. Miller, Columbus,	"
A. B. Slater, Providence,	R. I.
Samuel G. Stiness, Pawtucket,	"
Wm. H. Baxter, Petersburgh,	Virginia.
J. A. Thompson, Norfolk,	"
W. N. Tillinghast, Fayetteville,	N. C.
Thos. Turner, Charleston,	S. C.
Samuel Prichitt, Nashville.	Tenn.

The Secretary—If there are any members present whose names have not been called, they will please announce the fact.

Mr. Harbison—I suppose Mr. Sherman is so small a man that the Secretary could not see him. (Laughter).

The Secretary—Mr. Sherman has always been in the name of the Worcester Company.

Mr. Sherman—I do not represent the Worcester Company now.

The Secretary—We had better enter it under Mr. Sherman's own name. Are there any other gentlemen present whose names have not been called.

(Mr. J. H. Rollins announced his name.)

The Secretary—unless some other gentleman announces his name, I shall take the list to be perfect. I have the names of some few additional applicants which I will now read. These names I wish gentlemen to understand are all properly vouched for.

A member—And the money paid? (Laughter).

The Secretary—We will give them receipts when we get the money.

A member—I think the vouchers should be read.

The President—The Secretary will again call the names of the applicants for membership, and read the names of those who vouch for them, so that the Association will understand what it is about.

The Secretary then read a list of the applicants for membership, and the members of the Association who vouched for them. The applicants were as follows:

A. C. Humphreys, Bergen Point, N. J.
J. H. Smith, Newark, Ohio.
A. L. Allen, Poughkeepsie, N. Y.
C. F. Smith, Marlboro, Mass.
Chas. Collier, Selma, Ala.
Geo. Buist, Halifax, Nova Scotia.
Jas. Somerville, Knoxville, Tenn.
Lewis Moss, Sandusky, Ohio.
Edward L. Wood, Lewiston, Maine.

Richard J. Monks, Boston, Mass.
Edward Jones, Boston, Mass.
John M. Newell, New Brunswick, N. J.
Wm. Fiske Warner, Waverly, N. Y.
J. Linton, Ravenna, Ohio.
S. L. Wiley, Greenfield, Mass.
Wm. D. Cadwell, Nashua, N. H.
Chas. H. Nettleton, Derby, Conn.
Wm. Humphreys, Waterford, N. Y.
F. J. Davis, Waltham, Mass.
W. E. Waite, Brattleboro, Vermont.
David W. Crafts, Northampton, Mass.
Gideon Wood, New Bedford, Mass.
Wm. B. Durfee, Fall River, Mass.
James Slingluff, Norristown, Pa.
D. H. Fox, Reading, Pa.
Robert Young, Alleghany City, Pa.
Geo. W. Edge, Jersey City, N. J.
Justus Ditmar, Williamsport, Pa.
John Cartwright, Ponghkeepsie, N. Y.
James M. Starr, Richmond, Ind.
W. H. Pearson, Toronto, Ontario.
Fred. S. Benson, Brooklyn, N. Y.
F. C Sherman, New Haven, Conn.
C. F. Maurice, Sing Sing, N. Y.

A member—Before the Association acts upon these applications, I would like to know if all these gentlemen are connected with the gas business. It appears that the same members vouch for several of them. Perhaps some of them may be farmers, or not directly connected with the gas business.

The Secretary—They are all employed by gas companies. At any rate their applications are all properly endorsed by members of the Association, according to our constitution. There was one application made about which I felt some doubt, and I passed it. That is not on the list. In regard to the same members vouching for several applicants, I would state that at the hotel last night I told several of these gentlemen who wished to become members, to send their applications to me beforehand, and I thought I would get them all prepared, and vouched for in the regular way, before the Association met this morning, in order to save time. So I took the applications of gentlemen who were known to be connected with gas companies, to Mr. Cartwright and Mr. Chambers for their endorsement. The names of the applicants thus handed them for their endorsement were those of gentlemen who were known to be gas men. For instance, one was a gas engineer; another was a gas superintendent, etc. All the applications are properly endorsed, in the regular way prescribed by our constitution and by-laws, and these gentlemen, by virtue of their connection with the gas business, are all entitled to become members of this Association.

Mr. Price—Mr. President: The constitution of this Association provides that new members shall be received by ballot. This would take up a great deal of time. I will state that when the meeting was held in Washington we then adopted a short cut in regard to the matter; and I propose to offer a motion that we pursue the same course here, that is—that we authorize the Secretary to cast a ballot for all of these gentlemen. They are all vouched for properly, many of us know them personally—some of them, at least—probably they are all known personally to some members of the association, and it would certainly save a great deal of time and vexation if we were to authorize the secretary to cast a ballot for the association for these gentlemen. I make a motion to that effect.

The President—Gentlemen, you have heard the motion of Mr. Price. I will state that it requires the unanimous consent of the association. If there is a single objection we must vote by ballot, in the manner prescribed by our constitution.

There was no objection offered, and the motion of Mr. Price was carried.

The secretary announced that he had received another application for membership, from Mr. Geo. W. Edge, Superintendent of the Jersey City Gas Works. Upon motion, his name was added to the list already read.

The secretary then proceeded to cast a ballot for the Association for the admission of the new members, Mr. Neal acting as teller. The Secretary stated that he voted in favor of the gentlemen whose names he had read.

Mr. Neal—Mr. secretary, will you please count the vote? (Laughter).

The Secretary—That is the duty of the tellers.

The President—The secretary will announce the result.

The secretary announced that the gentlemen voted for were those whose names had heen read to the association, and that they were severally elected active members of the Assoiation.

The President—The next thing in order is the report of the Executive Committee.

The report of the Executive Committee was then read by the Secretary, and was as follows:

REPORT OF THE EXECUTIVE COMMITTEE.

To the Officers and Members of the American Gas-Light Association:

The duties of the Executive Committee for the past year have not been arduous, and there is but little to report. There are, however, one or two recommendations which your committee desire to make. In consequence of the adoption of the new constitution, we recommend that hereafter the Secretary be authorized to use only the names of individuals as members, in accordance with Article IV of the new Constitution, and not the names of companies in their organized capacity. The question of salary for the Secretary and Treasurer (the two offices being represented by one individual) was considered. After a full examination of the financial affairs of the association, we recommend that the sum of two hundred and fifty ($250.00) dollars be paid to Chas. Nettleton, Esq., for his services as Secretary and Treasurer for the past year.

Respectfully submitted,

W H. Denniston,
W. Henry White,
H. Stacey,
Geo D. Cabot,
Henry Cartwright,
} Committtee.

On motion, the report was accepted.

On motion being made for the adoption of the report, Mr. Harbison said: Before the motion for the adoption of the report is acted on, I move that we take up the recommendation of the committee in regard to the salary of secretary and treasurer of this Association. We may want to know what the salary will be from year to year, and decide upon some fixed sum. If we do not do this, but leave the amount to be fixed by the commitiee each year, there may not be enough money in the treasury to pay the secretary, or he may not be willing to serve for the amount they name.

Mr. Dennison—The sum fixed by us is for the past year, and for services already rendered. It has nothing to do with the current year. It can be fixed at the next annual meeting of the Association for the current year.

The President—The compensation named by the committee ($250) is for services already performed, and has no reference whatever to the future. Do you still wish to make an exception, Mr. Harbison?

Mr. Harbison—No, sir.

The motion for the adoption of the report was then carried.

The President—The next business in order is the report of the Finance Committee. Mr. James S. Chambers is chairman of that committee. Will he state if they are ready to make a report.

Mr. Chambers—I have only a verbal report to make. I have examined the accounts of the treasurer and find the same correct. I examined his accounts and vouchers according to the report which he presented, and I certify on that report that I find it correct.

The President—The treasurer will read his report.

Mr. Nettleton—I present the treasurer's report from the time the books and papers came into my possession. Gentlemen who attended the meeting in October last, will remember that Mr. De Mill acted as treasurer on the first day of the session, and at the close of the day he was obliged to go away and attend to other business, and at the close of the first day he handed over to me the papers and money. My account commenced at the opening of the second day. The treasurer then read his report.

The President—Gentlemen, you have heard the report, what is your pleasure?

A member—I move that it be referred to the Finance Committee.

The President—That has already been done.

The Treasurer—The chairman of the Finance Committee has already made his endorsement on the report, which I will read.

A Member—I think the natural course to pursue would be to refer the report to the Finance Committee, and that being done let them make their report in regard to it.

This question was carried.

The President—The Finance Committee therefore, by their chairman, report that they have examined the report of the treasurer and find the same correct. Are you ready for that question?

Mr. Harbison—Mr. President: As one of the members of the Finance Committee, I have had no opportunity to examine the report of the treasurer, and have not been informed about it at all.

The Treasurer—I was informed that Mr. Harbison was in Europe and would not be here, and so informed Mr. Chambers. I was also informed that Mr. McIlhenney has just arrived from Europe, and would not be here, and Mr. Chambers passed upon the accounts under that impression. I was under the impression that Mr. Harbison was in Europe, and would not be here in time to examine them.

Mr. Chambers—I was certainly informed that no other member of the Finance Committee would be here, and so I examined the accounts and vouchers myself, and I certified to them myself as chairman, and for no other member of the committee. I did not say that the Finance Committee had examined them, but that I, as chairman, had examined them.

Mr. Harbison—I withdraw my objection.

The President—The report of the treasurer has been accepted; now the question is upon the adoption of the report of the Finance Committee. On motion the report was adopted.

The President—The next business in order is the reports of special committees. Are there any special committees to report?

Mr. W. Henry White—Your committee appointed to draft resolutions on the death of Mr. Everett, is ready to report.

The President—Let the report be read.

Mr. White read the resolutions as follows:

Whereas, Time, the destroyer, having stricken from off the roll of the living the name of Cornelius L. Everett, Esq., the late respected President of the New York Gas-Light Company, it becomes at once our duty and a sad pleasure to testify to our appreciation of his merits as an accomplished gentleman, an upright business man, and a careful and skilful gas engineer, therefore be it

Resolved, That the American Gas-Light Association learns with profound regret of the death of Cornelius L. Everett, Esq., and while we cannot but view his taking off as his eternal gain and but a removal from earthly trials and sorrows to realms of peace; yet, as his fellow workers, we cannot but lament the removal from our midst of so much that was venerated and useful in his daily walk and life.

Resolved, That his career of nearly fifty years in his profession has been such as to command the highest respect and esteem of his fellow-engineers; during which time he has seen it grow from the cruder workings of its early promoters to its present efficiency, and in all and through all oe has been part of its growth and development.

Resolved, That this Association also sincerely regrets the recent death of Mr. C. C. Miles, late secretary of the same company. In him we recognized all those traits that distinguish the earnest and conscientious business gentleman.

Therefore be it Resolved, That this Association do adjourn at one o'clock P. M., in order to gvie its members an opportunity to attend the funeral of Mr. C. L. Everett; that these resolutions be spread in full upon our minutes, and a copy each to each of the families of the deceased, with our sincere and sympathetic regrets.

(Signed) WM. HENRY WHITE.
O. ZOLLIKOFFER.
W, H. DENNISTON.

The President—Gentlemen: You have heard these resolutions. What will you do with reference to the report of this committee?

Mr. Price—Mr. President: I hope the question of adjournment will be carefully considered. It seems

an unpleasant task to say anything that may imply want of respect to the distinguished dead, but it must be borne in mind that there are many members of this Association who have come a long distance to attend this meeting, and not to attend a funeral; I do not think we should waste a whole afternoon. I speak with entire respect—in attending the funeral of the lamented dead. I hope, therefore, that this point will be considered well before it is acted upon. If we adjourn over until to-morrow, we will either be obliged to cut our session short or stay over another day, which I suppose some of us could not well do. If we confine our session to one day, I think it will be a serious detriment to the interests of the Association, as we will necessarily have to pass over many subjects which ought to be discussed, and our meeting together will not be profitable. Many of us have come from a long distance, and have left our business, and cannot well spare the time to remain here another day. There are a great many important matters to be considered and discussed, and I hope the Association will not adjourn over until to-morrow. We could take a short adjournment which would give those who desired to do so, an opportunity to attend the funeral; but I do not see the necessity of adjourning over until to-morrow. We can, by a short adjournment, as well testify our respect for the dead, as if we were to adjourn for the whole day. I hope, therefore, the Association will carefully consider this matter.

Mr. Henry White—I would state to the Association that the committee carefully considered this very subject, and with some reluctance placed the time of adjournment as stated in the resolution. We supposed that at 1 o'clock the Association would naturally take any adjournment for lunch, and we supposed that of course, many of the members would desire to attend the funeral: and besides, we thought that in consideration of the distinguished character and high standing of the deceased, we should, in this way, most fittingly show our respect, and at the same time give those who desired to do so, an opportunity to attend the funeral ceremonies of the late Mr. Everett. A mere adjournment for two hours would hardly, it appears to me, seem proper.

Mr. Allen—I think the adjournment should not be later than three o'clock.

Mr. C. White—Mr. President: I would not like to see the resolutions published with the time of adjournment fixed from one until three, and as a copy will be transmitted to the family of the deceased. I do not think that such an amendment should be embodied in the resolutions. Let the resolution stand as it is, and we can pass another to the effect that this meeting adjourn to meet again at three o'clock. It doesn't seem to me to be necessary to modify the resolution as it now reads. Let the adjournment from one until three be by special resolution.

A Member—We had better let the resolutions go to the family of the deceased as they are, and pass a special resolution that we adjourn until 3 o'clock.

The President—Some gentleman will please make that motion.

Mr. C. White—I move, sir, that this Association adjourn at one o'clock and re-assemble at three o'clock, for the transaction of business. Carried.

The President—The reports of special committees are now in order. Are there any special committees to report?

REPORT OF COMMITTEE ON NAPHTHA GAS.

Mr. Neal—Mr. President; I suppose it is my duty as a member of this committee to make a report, and I must begin by an apology to this Association for coming before it with empty hands. I suppose that some of the members will be disappointed in not hearing anything from the naphtha committee, but I am sorry to say that that committee has no report to make. I greatly regret that this is the case, for I am deeply sensible of the honor the Association has conferred upon me and upon the gentlemen associated with me, in putting us upon so responsible and important committee.

We have investigated the subject as far as we could, but we come before the Association and apologize for not presenting a report, thank you for the honor you have conferred upon us, and ask most respectfully to be discharged from further duty.

One great difficulty presented itself in the composition of the committee. It was composed of three members; myself, residing in Boston; Mr. Henry Cartwright, residing in Philadelphia, over 300 miles off, and Mr. Clegg of Dayton, residing I don't know how many miles off, probably five or six hundred. We have had no opportunity for consultation.

We have conferred with each other somewhat by letter. I have had but one interview with Mr. Cartwright in regard to this subject, since the last annual meeting of the Association, except one I have had with him to-day. I have not seen Mr. Clegg, the member of the committee from Dayton, Ohio, since the last annual meeting of the Association. I had some correspondence with him before the last semi-annual meeting. Since then I have written to him once and received a letter from him to this effect:

"I am so busy building and attending to other business, that I have no time to give to the subject, and I shall be unable to be present at the annual meeting in New York."

So you see that the committee have not had an opportunity for conference; and I would respectfully suggest that if another committee is appointed, it should be composed of members who reside near each other, say in the cities of New York and Philadelphia, where they can meet often and get each other's views. It is impossible for the members of the committee to discharge their duty properly when they are separated by such long distances, and cannot meet and confer with each other.

If there is another committee appointed in our place, I think it would be better to have upon it at least one if not more persons who are engaged in the manufacture of naphtha gas. That was suggested at the last semi-annual meeting, but objections were raised, and I do not think those objections were well founded. Several persons engaged in the manufacture of gas from naphtha, and who are interested in the naphtha process, have stated that they thought there should have been added to the committee one or two naphtha gas men; and if only one had been appointed upon our committee, perhaps we might have had a report to make.

We have received many communications from different parties interested in the manufacture of naphtha or petroleum gas, and we have been treated very kindly and courteously by them, and we are happy to say that we have found a great many gentlemen who are engaged in the manufacture of naphtha-gas—a great many *gentlemen*. It has been intimated that these parties who are interested in the naptha process, go to members of committees or others and state to them that "we have a process here which, unless you adopt, will make trouble in your company." This has not been so with us. We have been treated with courtesy, kindness and cordiality. In many instances we have been invited to visit the works, and have been assured that all our expenses would be paid; that there should be no expense whatever incurred by the members of the committee in visiting their works. I say this in deference and out of regard to the feelings of some of the members of this Association, who represent the naphtha gas interest.

I would state for myself personally, I did intend, after the semi-annual meeting, to take this matter into consideration, and spend a good deal of time in the investigation of it as chairman of the committee, which it seemed to devolve upon me to do, but I regret to say that I was so much occupied I could not get the time, that in my opinion was necessary, to the investigation of it.

If what I have said may not be considered as an excuse for not preparing a report, I will state to the Association that the health of members of my family has prevented me from giving the necessary time to the subject.

I have made visits to different parts of the country I was obliged to go to the mountains on account of the health of a member of my family, and remained there some time. Then I returned and proposed to visit several places where naphtha-gas, in whole or in part, was being manufactured, but I was prevented by the same cause. I think that the gentlemen of the Association will consider that as an excuse, if what I have said before is not considered as an excuse. When a person is drawn on the jury if he wishes to be excused because he has so much business to attend to, I have frequently heard the Judge remark, "Why, you are just the kind of a man we want," so I think if you will not take the first excuse, you will the last.

The committee was appointed at the annual meeting in 1874, to report to the Convention "*to-morrow*," on the value of naphtha-gas compared with coal-gas. You see how little the magnitude of the subject was appreciated by the Association; that the committee was requested to report "*to-morrow*" on the value of naphtha-gas compared with coal-gas. In the after noon I asked the Convention if a report was insisted upon, and stated that it would be impossible to prepare and present a report in that time, and leave was granted to report in six months.

At that meeting Mr. Littlehales, the gentleman from Canada, moved that the committee be especially requested to investigate and report to the Association, upon the following points in reference to the naphtha-gas process, which was seconded by Mr. Cathels.

1st. The cost per 1000 for material.
2ndr " " " labor.
3rd. " " " purification.
4th. " " " wear and tear of retorts.
5th. " " " gas at consumers' meters calculated on gas paid.

6th. The rate of wages.

7th. Amount of capital required per million feet annual make, to construct works for naphtha, as compared to that of coal.

Now, Mr. President, you see there is an immense amount of work laid out for us, and I regret to say that we are not able to answer, conclusively, one of those questions. Immense works are being built all over the United States and Canada, and we might say the whole of America, which you know are very expensive. We find by correspondence, that naphtha-gas is made either clear or in combination with other materials, all over the United States. I could not name the number of companies where it is used more or less, but there are a great many. So you see if we were to make a report, and base the comparisons and estimates upon the operations of one company, such a report would be of little value. In order to report intelligently we would have to obtain data from five or six companies. You might ask why we did not visit these works and obtain the data. It is true it was suggested at the last meeting of the Association that the expenses of the committee should be paid to travel. That would not help the matter any, for, though our expences might be paid, who would pay us for the loss of time in our business?

Another difficulty about this investigation was that we found it utterly impossible to embrace all that we ought to embrace in the report, in order to make it satisfactory. So I have appeared before you in this manner, and trust you will pardon me for making a verbal instead of a written report. I know it is the custom to make these reports in writing, and it would probably be more courteous to the Association to present what I have to say in the form of a paper, but I supposed we would have a faithful reporter, and that a verbal explanation would answer my purpose just as well.

I wish once more to thank the Association for the honor conferred upon the committee in referring to us so important a matter, and to express our regret that we are unable to make this long desired and long looked for report.

We have tried as a committee to discharge our duty faithfully, but it has been the result of circumstances over which we had no control—such as want of time

and inability to leave our families by reason of sickness, that we have not been able to make a report, and also for other reasons, which appear cogent when presented.

Now, Mr. President, we do not wish to be understood as saying that there is no need for further investigation. Whether such investigation should be made by this Association, or by members of different companies I will not say; that is for the Association to say whether it will appoint a committee or not. If they determine to do so, I should say that there should be placed upon that committee one or two gentlemen who are interested in the naphtha process. Or perhaps the Association might resolve itself into a Committee of the Whole, and investigate the subject in that way. I do not think it would be well to dismiss the matter entirely. I think there is something in it, and that it is worthy of full investigation and consideration. There are gentlemen who are interested in this process—energetic and conscientious gentlemen—who do the brain work, and who are expending large sums of money in the investigation and practical operation of the naphtha process. They are, we may say, doing it for themselves and for their own benefit. But if they are expending a large amount of money and much time and labor in experimenting upon and investigating this important subject, and in so doing make discoveries and arrive at practical results, which will be of permanent advantage to themselves in manufacturing gas, those discoveries and results will also be of benefit to us, and hence they deserve our warmest thanks. Therefore, I think the Association should, by all means, prosecute earnestly inquiries in regard to this most important matter. If any one is so fortunate as to discover a process of manufacturing gas from naphtha, or from anything else which shall be cheaper and better, then, certainly, it will be of benefit to all who are engaged in gas manufacture. We cannot deny that the naphtha question is a most important one; that it has not been fully investigated, and that its capabilities and practical results have not, as yet, been fully determined. Some benefits may have resulted, possibly, from the experiments which have already been made, and I do not think we should do anything to prevent those who have made them, from going on with the good work.

If they can accomplish anything, and are willing to spend their time and their money, their thoughts and their labor on the subject, let them do it. Do not let us do anything to prevent it, but rather let us seek by earnest and conscientious investigation to discover if there is anything of permanent and practical benefit in it.

Again permit me to thank you, gentlemen of the Association, on behalf of myself and of the other members of the committee, for the honor you conferred upon us in entrusting to us the investigation of this important question, and to express our most sincere regret that circumstances over which we had no control, have prevented us from making a report to-day.

In conclusion, I most respectfully repeat my request that the committee be discharged from further duty in the matter.

Mr. Price—Mr. President; I know that the members of this Convention very much regret and are disappointed that this committee has not been able to report. I think almost all of us have looked forward with a great deal of interest to the results of their investigation of the manufacture of naphtha-gas. The London *Journal of Gas-Lighting* anticipated this report and spoke of its importance; but I move that the apology of the committee be accepted and that they be discharged. Carried.

[To be continued.]

The following soluble glass is best adapted for coating brick and stone: Dry carbonate of potassium, 10 parts; powdered quartz, 15 parts; charcoal, 1 part. Sand, free from alumina and iron, may replace the quartz. Fuse together and dissolve in boiling water of 5 or 6 times the weight. Filter.

Correspondence

[Correspondents, in all cases, should sign their communications with their names and address in full—not necessarily for publication, but as a guarantee of good faith.—Ed.

Modern Gas-Lighting—Street Loss.

San Francisco, October 7, 1875.

Mr. Editor: My recent memorandum concerning the street loss accounts of foreign gas companies was sent to you for publication, in the belief that its data might have escaped some of your readers.

So completely hidden were they under uninteresting matter, that only a systematic search brought them to light, and thus rewarded me for time and labor expended.

These data will, perhaps, be supplemented by a general compliance with the request for *American* street loss facts, in which case I will at some future day consider exhaustively the combination of mechanical device, muscle and money, which can alone bring the canalization of paved streets to proper condition.

The state of our great industry in America is such that most, if not all, of the companies will object to the mention of their names. This mention, however, is in no way important, compared to the fact that such and such returns are *officially* made.

Within my own experience, the street loss on 18 miles of mains was reduced from 18 to 8 per cent. within two months; the course mainly pursued being probing with a pointed bar, as mentioned by Mr. Nettleton, and digging to the joints thus ascertained to be in fault.

A portion only (perhaps a mile or so) was actually stripped and re caulked. In this case but few of the streets were paved, and the soil so loose a sand that the surface water of heavy rains was, and probably still is, drawn off by running a furrow through the saturated superstratum—housing the donkey, mule and plow which constitute this unique drainage engine, and letting the water run into the furrow and so to dry, bibulous sand below, at its own sweet will

The facilities for repair were unusual in this case, and the necessary outlay but trifling.

I have few data of American street loss as yet; but among them I find 1st; A company *selling* 10,400 cubic feet per ton. 2nd. One selling 10,000 cubic feet per ton. 3rd. A street loss of but 5 per cent.

A good many years ago, when it was first proposed to divide London into districts, one of which should be allotted exclusively to each company, the *London Gas Journal* published in support of the project a little map of the existing underground connections at, I believe, Charing Cross. Such an entangled network of piping the world could never see *outside* the metropolis, and it is devoutly to be hoped, will never any more see *within* its limits.

In a few days I will be in a position to reproduce this map, when your readers will fully understand how one company would sometimes connect its meter to another company's main, in spite of all honesty and precaution, and of delicate olfactory differences between the gases, which were tolerably distinct to the keen noses of practiced service-gangs. Nor will we wonder that the Phœnix, and other companies, owned to 30 per cent. loss before that establishment of independent districts which is now happily accomplished.

If I can in any way add to Mr. Nettleton's more general paper the details of actual and proposed procedure, and thus in some measure arouse a single company from a happy-go-lucky apathy which sometimes exists, he and I will get up a little Mutual Admiration Society, in default of outside praise.

After these few comments on one subject, let us turn to another.

In the successive numbers of your Journal will be given a series of articles upon certain comparatively novel apparatus and processes in gas-lighting.

These articles will, from the varied demands upon my time, be rather more conversational and sketchy than is appropriate to the importance of the subject; but may be interesting as the views—sufficiently iconoclastic in part—of one who is honest and wishes well to his professional brothers.

As this good-will goes out with greatest heartiness to the army of martyrs who perspire over the complex duties of small gas works, no difficult analysis or quotations will be employed, except where absolutely necessary.

No more will be attempted in this introductory than a sketch of the subjects to be gossiped about:

First, then, we will begin at the Retort House, and consider whether or not our present distillatory process can be improved so as to reduce or entirely stop the production of tar, and increase the volume of gas produced.

Under this section we will of course look up the regenerators in Peckston, glance at Lowe's reciprocating retort and Clegg's web retort, see what, if any, wrinkles lie *perdu* in English patent files, and try to get at the bottom truth amid the maze of contradictions surrounding A. Malam's setting.

Incidentally, we shall almost certainly find other attempts, more or less successful, carrying note-worthy promise.

While on the subject of the Retort House, we may allude to the interruption of the Seal, and show how a pile of coke-dust may be turned into a sizeable heap of coin, without calling the ghosts of mediæval alchemists to our aid.

The Foulis Mechanical Stoker is advantageous in large works, but we will do little more than reprint a description of it.

The last feature of this "Firstly." will be the submittal of a new form of Hydraulic Main which may meet with favor from those who prefer the "grand simplicity" of a permanent seal to the advantage of increased gas-yield undoubtedly afforded by carbonization in vacuo.

Second. Next to the Hydraulic Main should follow a Pelouze & Audouin Condenser, the action of which, *so situated*, will be to remove all the tar and naphthaline.

This machine has already been fully described in your columns, and we will therefore again devote to it only a few remarks upon the special functions due to its special place.

Third. A steam-jet Exhauster will follow the Pelouze & Audoin Condenser. We will here describe the Korting form of this exhauster, which is widely used in Europe; and the MacKenzie Steam Jet Exhauster, which is a purely American contrivance built by the Smith & Sayre Manufacturing Co.

Fourth. A new, and it is believed, very advantageous form of Immersed Multitubular Condenser will be described; appropriately following the Steam Jet Exhauster.

Fifth. A Pelouze & Asdouin Condenser should be used after the Multitubular Condenser, to separate from the cooled gas all watery matter, with much of its contamination of ammonia, sulphuretted hydrogen, and carbonic acid.

Sixth. Next follow a set of four Dry Lime Purifiers, working the hydrate in the nodular condition, and so handled as to separate very little if any impurity except carbonic acid. The Beckton people call their large preliminary purifiers "carbonates," and work them as we propose to work our own.

Seventh. Following the "carbonates" are four purifiers, working the St. John & Cartwright "Iron mixture," or any material which is shown to possess power to arrest both sulphuretted hydrogen and ammonia.

Eighth. We finally employ a "Driving Exhauster" (rotary) to relieve the pressure due to six purifying boxes.

I have said enough to show my drift to any studious gasmaker, and will be glad to receive hints or information from any source, particularly in regard to the composition and effect of the St. John & Cartwright mixture, and of its rivals, if any there be.

I have not mentioned Hill's Liquor Process of Purification, although its exquisite theory and effect will receive as fair discussion as our present knowledge of it will allow.

I will endeavor to mail some matter concerning the Retort House next week. Yours truly,

James R. Smedberg.

A Correction.

TITUSVILLE, PA., October 21, 1875.

Mr. Editor: In your issue of 16th instant in correspondence entitled "Cheap Remedy for Naphthaline," in the 2nd method reading "Use as in former method one gallon petroleum to every five hundred feet made," should read to every five *thousand* feet made. This difference to the careless reader would detract considerably from the idea of cheapness.

Yours, etc. X.

Report of the Committee on Fires, Patents and Gas Machines.

At the ninth annual meeting of the National Board of Underwriters held in this city last spring, a report was read from a committee, previously appointed, upon "the origin of fires, patents and gas machines." Mr. W. H, Ross, the Manager of the United States Branch of the Queen Insurance Company of London and Liverpool, in submitting this report as chairman of the committee, has given some very clear and concise statements as to the dangers to be apprehended by underwriters from oils, and we take the liberty of laying portions of them before our readers.—ED.

"OILS.—The danger to be apprehended by the Underwriter from oils is mainly from two causes: From throwing off an inflammable vapor, and from their tendency to produce spontaneous combustion. The danger from vaporising is confined to the coal, earth, or petroleum oils, which are not liable to spontaneous combustion. Hence we speak of coal or petroleum oils as a source of danger, separate from other dangerous oils, which will be treated under their appropriate head of spontaneous combustion.

"The investigations heretofore brought to your consideration in regard to the chemical constituents of petroleum and its products, render any discussion of that point unnecessary. That the danger is inherent and imminent in the lighter and more volatile products is established beyond a question. Danger from that product of petroleum which should be in legitimate use for illuminating purposes, viz., kerosine oil, is not necessarily inherent, but arises from the cupidity of the manufacturer or dealer, who adulterates by mixing with it the volatile portion that had been distilled out of it.

"These are facts. The question to be solved is: What remedy is there within the power of the Underwriter to apply? We unhesitatingly recommend that as the form of policy adopted by this Board distinctly prohibits the keeping or using in any form or any quantity of either of the lighter products of earth oils, no privilege shall be granted for such use or keeping, except under such regulations, and in such form as may be adopted by this Board or its Executive Committee. This recommendation is not so arbitrary or unjust as the owners of such property might declare it. The storage of gunpowder in quantity is prohibited by municipal authority. No man for a moment doubts the propriety or justice of such prohibition; yet fire must be brought in contact with gunpowder to produce explosion; but the vapor of these lighter products of coal oil escapes, and sometimes reaches the fire at a distance of several feet, causing ignition or explosion where gunpowder would have been harmless.

"In regard to kerosene oil the remedy is not so simple. While the legal restriction establishing a standard by the United States Government inflicts a penalty, it fails to enforce an inspection. Unless such inspection is compelled by State, township or municipal regulations, and sustained by public opinion, the Government standard is valueless for protection to life and property. There is also some ambiguity in the United States law in regard to the actual standard of safety. Doubtless it was the intention of the law to establish 110° as the *flashing point*, or the degree of temperature below which the oil should not give off an inflammable vapor; but it has been sometimes treated as the *burning point* of the oil itself. This would reduce the flashing point below 100°, and at least twenty degrees below the safe limit."

On spontaneous combustion the report says:

"A chemical definition of combustion is rapid oxidation. A combination of fibrous material with substances that absorb oxygen freely will at varied temperatures result in ignition—i. e., fire.

"When any substance that absorbs oxygen freely, by being finely diffused, exposes sufficient surface to the action of the atmosphere to ignite the combustible material with which it is in contact, at an ordinary temperature, it may be termed spontaneous combustion.

"All the commercial vegetable oils have great affinity for oxygen, or oxidize freely.

"When fibrous materials, such as are used in the manufacture of textile fabrics, become finely divided and then partially saturated with a vegetable oil, the conditions for action of oxygen upon them are of the most favorable character; the oil has been so diffused as to present the greatest possible surface to the oxidizing process, and all that is then wanting to carry on the operation with sufficient rapidity to produce combustion or ignition of the material so saturated, is a slight amount of moisture and a warm temperature, less than that of the body, and the process is complete—silent and efficient. Under its action millions of property have been destroyed, and the origin of fire reported *unknown*, instead of being assigned to its real cause, the improper use of vegetable oils. There are other causes and other agents that produce spontaneous combustion, as is the case with wet iron filings and turnings, and phosphorus. But those with which underwriters have to do, are chiefly oils oxidizing at comparatively low temperatures, and our attention in this report will be confined chiefly to them.

"Animal oils in commercial use, when pure, are comparatively free from this danger. The petroleum oils of the United States, being hydro-carbons, do not oxidize freely, and will not at ordinary temperature produce sufficient heat to produce combustion—the chief danger being from the vapor evolved therefrom, which is highly inflammable and ignites at comparatively low temperature. But they have not within themselves the elements to produce ignition. Hence the *heavy* products of petroleum, such as do not evolve vapor at a lower temperature than 360° Fahr., are the safest and most valuable lubricators, as their waste will not ignite unless in contact with fire.

"There is an oil extracted from a South American nut, that is used for dressing silk, that has a decided tendency to produce spontaneous combustion; but this is being superseded by a dressing made from paraffine, and may not need special attention. The limited amount of fish oils that tend to this danger hardly require special action.

"The oils to be avoided in this connection are chiefly the vegetable oils of commerce. These all have within themselves the proper elements to produce ignition, under favorable circumstances, at a comparatively low temperature. When diffused, as in the process of manufacture of textile fabrics, their use for this purpose should be entirely discarded, and great caution should be used also to exclude oils adulterated with them and sold under other names. This should apply principally to the manufacture of wool, and of wool and shoddy or cotton combined—although oily rags used in rubbing furniture saturated with these oils are extremely dangerous."

The same report includes a report of a similar committee of the New York Board of Underwriters, on the subject of Carburetters in "Gas Machines," which sums up as follows:

"To briefly recapitulate: Your committee find, as the result of very thorough investigation, that carburetters should be constructed throughout of brass or copper; that only those using the automatic feed and absorption process are safe; that the pipe should be so inclined as to drip back into the machine; that water is the best filling for the space between the inner and the outer tank; that all the inlets and the outlets of the carburetter should be gas-tight and water-sealed, and the whole securely enclosed in a strong wooden box, to be kept locked; that the hydrocarbon should be handled only by experts, approved by the Committee on Carburetters, and conveyed to the machine in gas-tight cans of inspected and approved construction; that carburetters should be located generally in the cellar, in a light place, remote from furnaces and heaters, and accessible without passing in the neighborhood of fire; and that carburetters should not pass from the control of the manufacturers and parties responsible for them into the possession of the individual using them, either by sale or lease for long periods."

Gas-Light Intelligence.

In our last issue, under the head of "Prices of Gas in America," we stated that the price per thousand feet in Washington was $3.56. We are informed that since July 1st, 1874, the price has been $2.50 per thousand. In Quebec it is $2.40 per thousand. In Rochester it is $3 per thousand.

In our last issue also appeared a small paragraph in "Gas Intelligence," stating that loud complaints were made of the gas in Hamilton, Canada. This was taken from an exchange and found its way into our columns as a gas item. We are very glad to give space to the following, which speaks for itself, and regret that we should have been in error in inserting the item referred to:

HAMILTON GAS-LIGHT CO., Oct. 25, 1875.

Mr. Editor: I notice in the GAS-LIGHT JOURNAL of the 16th inst., that under the head of Canadian news you state that "loud complaints are being made of the inferior quality of the gas supplied" to the city of Hamilton.

As far as this company is concerned, I might have allowed this statement to pass unchallenged, for the consumers here who are the parties most interested in the quality of gas know how unfounded it is, but in justice to our engineer and manager I deny in the most unqualified terms the correctness of the paragraph referred to.

If consumers have *any* complaint to make, we very quickly hear it from them direct or through the local papers; but as no complaint on the score of the quality of our gas has reached us from *any* source for very many months, you will readily see that "loud complaints" could not have been made, and I state as a fact, that no complaints whatever have reached the office from consumers direct or through the newspapers. On the contrary, where an opinion has been expressed on the quality of our gas it has been of entire approval.

I will state further, as you may not be aware of the fact, that the Dominion Government have enacted a law regulating the inspection of gas and meters. Under this law the companies of Ontario are required to give an illuminating power of twelve (12) candles. For the last two years this company has given an average of upwards of fifteen (15) candles, or 25 per cent. more than the law of the land demands.

I am sir, your obedient servant,

F. W. GATES, President.

Chemical and Scientific Repertory.

Chloroform, which has undergone decomposition by exposure, can be easily purified by shaking it up with a few fragments of caustic soda.

Equal proportions of turpentine, linseed oil, and vinegar, thoroughly applied and then rubbed with flannel, is an excellent furniture polish.

A permanent and handsome reddish color may be given to cherry or pear tree wood by a coat of a strong solution of permanganate of potash, left on a longer or shorter time, according to the shade required.

A pound of copperas dissolved in a pailful of soft soap, and, when thinned with water, applied to onions, is good to keep off the maggot, and to promote the growth of the onions.

Handsome ornaments can be made by mounting fern leaves on glass. The leaves must first be dyed or colored. They are then arranged on the mirror according to fancy. A butterfly or two may be added. Then a sheet of clear glass of the same size is placed on top, and the two sheets secured together at the edges and placed in a frame.

During the month of July the progress at the St. Gothard tunnel was as follows:—Length driven from north side, 113·40 metres; length from south side, 127·20 metres; total length driven during July, 240·60 metres. The position of these works on the 31st July was as follows:—North side (Groeschenen) 2,330·90 metres; south side (Airolo), 2,103·70 metres; total length driven, 4,434·60 metres; length remaining to be driven, 10,485·40 metres. Total length of tunnel, 14,920·00 metres.

A DANGEROUS POISON.—A dangerous poison has recently been discovered to exist in the bamboo cane. The cavity at each joint contains a quantity of small black fibrous matter, covered with an almost imper

ceptible coating of tissue, which conceals the poison. If swallowed, the filaments do not pass into the stomach, but remain in the throat, producing violent inflammation, and finally death. Juvenile smokers of the cane ought, therefore, to be careful.

WATERPROOF MARKING INK—

Shellac	2 ounces
Borax	2 ounces.
Water	25 "
Gum arabic	2 "
Lampblack, sufficient	

Boil the borax and the shellac in the water until they are all dissolved, add the gum arabic, and withdraw from the fire. When the solution has become cold, complete twenty five ounces with water, and add enough lampblack to bring it to a suitable color and consistence. The ink is to be kept in glass or earthenware vessels.

Pencils have lately appeared, the writing of which is capable of being copied, more or less perfectly, in the press. They are said to be made of a mixture of graphite, kaolin, and blue violet aniline. The graphite is used in the form of a thick paste, the kaoline in a finely pulverized state, and the aniline in the form of a very concentrated aqueous solution. The whole when well mixed is moulded under the press with cylinders about four inches long, and of the required diameter. Gum arabic may be substituted for the kaolin.

A DISINFECTING COLOGNE.—A correspondent of the *Philadelphia Medical Times* says: "During the prevalence of smallpox in 1871 and 1872, I had frequently been requested by my friends to prepare a cologne possessing disinfecting properties. I found in preparing such an article that upon mixing hydrate of chloral and carbolic acid the disagreeable odor of the latter was almost entirely removed, and upon adding these to spirits of lavender or ordinary cologne-water, a not unpleasant odorous volatile solution resulted. This, used with an atomizer, readily saturated an ordinary sized apartment with the vapor of these most valuable antiseptics."

Fruit is kept in Russia by being packed in creosotized lime. The lime is slaked in water in which a little creosote has been dissolved, and is allowed to fall to powder. The latter is spread over the bottom of a deal box, to about one inch in thickness. A sheet of paper is laid above, and then the fruit. Over the fruit is another sheet of paper, then more lime, and so on until the box is full, when a little finely powdered charcoal is packed in the corners, and the lid tightly closed. Fruit thus enclosed will, it is said, remain good for a year.

The following table for boiling fruit in cans will doubtless prove useful, as the present is the time for putting up such preserves for winter. The first figure after the name of the fruit refers to time of boiling in minutes, the second to ounces of sugar to the quart: Cherries, 5, 6, r raspberries, 6, 4; blackberries, 6, 6; gooseberries, 8, 8; currants, 6, 8; grapes, 10, 8; plums, 10, 8; peaches (whole), 15, 4; peaches (halves), 8, 4; pears (whole), 30, 8; crab apples, 25, 8; quinces (sliced), 15, 10; tomatoes, 30, none; beans and peas, three to four hours.

GUTTA PERCHA.—A Boston merchant, who imports nearly all the gutta percha which enters the United States, writes to the *Scientific American* to say that "the only region of production thus far discovered is the East India islands in the immediate vicinity of Singapore." The principal use made of gutta percha is for insulating telegraph cables and for cementing. India rubber is collected in localities all around the globe between the tropics. The best comes from the banks of the Amazon River. Brazil produces annually about 14,000,000 pounds, and the Central American States, Africa, and the East Indies together about 15,000,000 pounds. The consumption of india rubber is about equally divided between the United States and Europe.

In using Paris green to exterminate the potato bugs, the poison should be mixed with the cheapest grade of flour, one pound of green to ten of flour. A good way of applying it to the plants is to take an old 2 quart tin fruit can, melt off the top, and put in a wooden head in which insert a broom handle. Bore a hole in the head, also, to pour the powder in, and then punch the bottom full of holes about the size of No. 6 shot. Walk alongside the rows, when the vines are wet with dew or rain, and make one shoot at each hill.

The repeated applications, to copper or brass, of alternate washes of dilute acetic acid and exposure to the fumes of ammonia will give a very antique-looking green bronze; but a quick mode of producing a similar appearance is often desirable. To this end the articles may be immersed in a solution of 1 part of perchloride of iron in 2 parts water. The tone assumed darkens with the length of immersion. Or the articles may be boiled in a strong solution of nitrate of copper. Or, lastly, they may be immersed in a solution of 2 ounces nitrate of iron and 2 ounces hyposulphite of soda in 1 pint water. Washing, drying, and burnishing complete the process.

NEW REMEDY FOR BURNS.—There has been in hospital for many months a case of extensive burn, in which different applications have been tried. Every new dressing succeeded well for a time, but soon it ceased to prove of advantage. The last agent that has been used, and is used at present, is salicylic acid. The effect is more beneficial than that obtained by any of the former remedies. The method of using it is to form an emulsion with olive oil, one part of the salicylic acid to sixteen parts of oil. This mixture is painted over the ulcerated surface once or twice a day. It gives rise to a slight smarting sensation when first applied, but that soon passes off.—*Med. Times.*

The Average Meter System in Paddington.

The average meter system, as applied to public lights, is, we are happy to see, being more and more adopted: and, in view of further extensions, we may here quote from Mr. Weston's report a description of the meter adopted in Paddington, at the suggestion of the Metropolitan Gas Referees. It is really the meter first employed by Mr. Hawksley at Nottingham, and has already been described in our columns, in a paper by Mr. C. Hawksley on the working of the system in that town. The reproduction of the account of the meter to-day needs no excuse:

"It may not perhaps be out of place in this report to give a brief description of the lamp-meter in use. It is a well known fact to gas engineers and gas manufacturers, that ordinary consumers' meters of small capacity are very unreliable in their registration when applied to street-lamps, and should not on any account be used for such purposes; hence the necessity of having a meter specially constructed, in order that the friction may be reduced to a minimum. In the meter used scarcely half a tenth pressure is absorbed by friction. It must not be expected from this that any meter will supply gas for ordinary lighting purposes at this low pressure; but, supposing the pressure on the inlet pipe to equal a column of water 1 inch in height, the pressure at which the gas would be indicated on the outlet-pipe, after passing the measuring-drum, would be 9½-tenths, showing that only half a tenth has been absorbed by friction in working the meter. This result is arrived at by the increased diameter of the measuring-wheel, which is equal to a 5-light meter, and diminished in depth of rim to nearly equal the capacity of a 3-light ordinary meter, and the quantity passed per revolution being ·125 of a cubic foot, or 12 cubic feet per hour. This extra diameter assists in distributing the pressure further away from the central axis, thereby increasing the leverage of the measuring-drum, and, of course, greatly reducing the friction. This class of meter cannot by any chance be overtaxed, or even worked up to its maximum power, having only one light of five cubic feet per hour to supply, and that controlled by a *governor at the burner*.

"The cause of the varying quantities recorded in the meters after passing through the *governors* to the burners, is due in a great measure to the partial stoppages in the service-pipes belonging to the company, such as water, defective supply-pipes, naphthaline, etc., as well as different pressures given during the hours of burning, and more especially to the many atmospheric changes that take place during the seasons; for instance, during sudden variations of temperature, numerous lamps, both metered and unmetered, especially the latter, will have the gas way so impeded with naphthaline that scarcely three feet of gas per hour will be passing, and in some instances they go out altogether, in consequence of this crystalline substance forming so rapidly in the fittings, thereby causing incessant inconvenience and trouble. So soon as discovered, the lighters have been instructed to remedy the defect by pouring a little paraffine oil through the cocks and stand-pipes, which generally has the effect of dissolving this substance."

In a letter Mr. Weston addressed to the Journal, which was published in the number for August 17, (*London Journal of Gas-Lighting*, Sept. 21st) appeared a very useful table, showing the possible variations in the quantity of gas passed by governors, duly tested, at different pressures.—*London Journal of Gas-Lighting.*

The Water Works of Virginia City, Nevada.

The people of Virginia City, Nevada, claim to have the best and purest water of any community in the world; and when it is stated that the supply is obtained from a pure mountain creek, rushing down fresh and clear from the region of perpetual snow, the claim will be pronounced reasonable, But this priceless boon was attained at the expense of immense labor and the application of great scientific skill, by which was overcome the huge obstacle of the Washoe Valley, which had to be crossed by the main pipe. The supply is from Dall's Creek, near Lake Tahoe in the Sierra Nevada mountains.

The water is brought in an eighteen inch flume, four miles long, to a spur overlooking the Washoe Valley, 2100 feet above the Virginia and Truckee Railroad track. There it is received in an iron pipe, which descends into the valley, crosses it and ascends on the other side to the height of 1540 feet above the railroad track at Lake View station. The length of this inverted syphon is a little less than seven miles. The amount of water thus introduced into the city is 2,000,000 gallons per day, though this rate can be largely increased by a continuous full head of the supply. The leading of such a stream of water across such a valley is said to have no parallel in hydraulic engineering. The pressure on the pipe is enormous, and is estimated the same as a column of water 1720 feet high. The orifice of the pipe is 12 inches in diameter. At the point where the pressure is greatest it is 5-16ths of an inch in thickness, and rivited together with 5-8th inch pipe rivets. As the pressure grows less, the thickness of the pipe is decreased gradually till it reaches 1-16th of an inch.

The amount of rolled iron used in the manufacture of the pipe is 1,150,000 pounds. A million rivets were used in its construction. It took 50,000 pounds of lead to fasten the joints of the sections. Before being accepted for use, each length of pipe was heated to the temperature of 380°, and plunged in a bath of asphaltum and coal tar, to prevent corrosion. The line of pipe is compelled to twist and curve to fit the inequalities of the ground, and crosses thirteen steep canons. At the bottom of each depression there is a blow-off cock, used to remove any sediment that may accumulate. At each elevation is an air-vent. The water, when received into the pipe from the flume passes through wire screens and charcoal.—*Iron Age.*

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TUESDAY, NOVEMBER 2, 1875.

WISHING TO MAKE THIS JOURNAL an organ of intelligent discussion to those of our readers who may wish to gain or give information on the subjects to which its columns are devoted, the publishers solicit letters from all among them who make the study of these subjects a pleasure, or a profession.

Subscribers would confer a favor upon us by remitting *CHECKS*, or *POST OFFICE MONEY ORDERS*, as we are frequent losers where money is enclosed in letters.

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THE THIRD ANNUAL MEETING OF THE AMERICAN GAS-LIGHT ASSOCIATION.

HELD AT NEW YORK, OCT. 20TH AND 21ST, 1875

The Third Annual Meeting of the American Gas Light Association, which was held at Masonic Hall, corner of 23d street and 6th avenue, in this city, on the 20th and 21st insts., was the most successful of any ever held by the Association. There were over one hundred members present, and throughout the whole proceedings there was manifested a careful, considerate attention by all those present to the matters under discussion, which is the best omen for its future success and usefulness. The benefits that may be derived from an Association of this kind, to its members, are very great, if the deliberations are conducted in that careful and thoughtful manner that seemed to us to be so apparent throughout the last meeting. The members present were from all sections of the country, and the membership of the Association was enlarged by the admission of between thirty and forty new members from various sections of the land, and among them men of long years of experience in gas-msking, whose practical knowledge and careful study of the subject can not but have a very excellent influence in strengthening and building up the society, and placing it upon that basis that its founders and promoters most sincerely desire, viz.—"Second to none at home or abroad."

We do not claim that it has reached that point, but we do think it has taken very important steps in that direction, and all that it has to do is to perservere in well-doing and the goal will surely be reached. It may be years before it accomplishes that, but if the Association only makes a proper use of those elements within itself, and within its own reach, there can be no failure. Let every member then begin from to-day and so arrange the record of what he is doing in his own individual sphere of action, that at any time he can not only know exactly what he is doing from day to day, in each and every branch of the business under his charge; but that, if need be, he can impart so much of his information to others as occasion may require, in order to form a just and true estimate of the comparative value of different processes, methods of proceedure, etc.

In this way when they come together, they will "know whereof they speak," and a discussion of different points will be of benefit to all, and the records of the Association will be of value not only as a record of facts, but as a record of progress in gas making in America. We think that the character of the deliberations at this meeting was such as to warrant the belief that a bright future awaits the American Gas-Light Association, and that its members are determined that the lustre of that brightness shall be that of intelligence and usefulness.

The first meeting was at 10 A. M., on the 20th. The President, General Chas. Roome, called the meeting to order, and in a few happy, pointed, and straightforward remarks, congratulated the members upon meeting together again, and urged them to pursue that calm and fair-minded course in their deliberations, which ever characterizes men whose object is to advance the general good.

The reading of the records of the last meeting was dispensed with, and the election of new members was proceeded with—about thirty-five names were added to the roll.

The President then announced the death of Mr. Everitt and Mr. Miles, the President and Secretary of the New York Gas-Light Company, and paid a fitting tribute to their memory in a few words and invited the Association to attend the funeral of the former on that day. A committee was appointed to present appropriate resolutions, and upon the report of this committee it was voted to adjourn at one P. M., to enable those of the members who desired, to attend the funeral. After the calling of the roll the members were informed that receipts were ready for them to pay their annual dues. The reports of the Executive Committee, the Finance Committee, and the Treasurer were presented, and accepted. The Executive Committee made one recommendation, which was adopted, to the effect that the names of individuals, and not of gas companies, should be entered as members.

The next business in order was the reports of Special Committees.

The first in order was the committe on naphtha gas, which had been looked forward to with no small interest by a great many members. The report was a verbal one, and made by Mr. Neal, of Charlestown, Mass., who apologized for coming before the meeting with empty hands, and stated that they had no report to make; the widely separated residences of the members of committee rendering consultation very difficult, adding that they had received many communications from parties interested in various naphtha and petroleum processes, and that in every instance they had received the greatest courtesy from them. He closed by asking that the committee be relieved from further consideration of the subject, and suggesting that should another committee be appointed, a portion thereof should be men engaged in making naphtha gas, as the matter was a very important one and should be got at fully and fairly.

The election of officers was then proceeded with, and the result will be found in another column. The re-election of Gen. Roome, as President, was received with applause; and, upon taking the chair, the President addressed the members in a very appropriate, earnest speech, urging upon all the importance of a strict attention to the matters in hand, and the necessity of adhering to facts, omitting the poetry and leaving the eloquence to others. After paying a passing tribute to the honorable calling in which they were engaged the President closed amidst the hearty applause of all present. An adjournment till 3 P. M., was then voted, at which time the Association re-assembled, and listened to a paper read by Mr. J. D. Patton, of Trevorton, Pa.—"On the use of Petroleum and its Products in the Manufacture of Gas." We regret that want of space prevents our giving this paper in full in this issue, but we give the following salient points:

His experience with petroleum in gas-making was almost entirely with the grade of oil known as naphtha or benzine. The result of that experience is a yield averaging about 70 feet per gallon of 70 candle gas, in constant running day after day. He never had been able to exceed 100 feet per gallon, or obtain results below 56 feet per gallon. Amount of fuel for converting 1 bbl., about 7½ bnshels coke. The gas thus made stands all tests that coal gas will. Retorts last, on an average, 6 months, and cost $90 per bench to renew. Cost of 70 candle gas, $1.17½ per thousand, exclusive of labor and interest. The labor required is less than half that of coal-gas. "As far as established companies are concerned, can it be used profitably in connection with coal-gas?" His experience shows that it can, by using 8 or 10 per cent. of oil-gas. By working out all the gas you can, you may, from Westmoreland coal, get 13,000 feet gas, of 16 candles, from one ton of coal and 16 gallons of oil; or 1 ton coal and

32 gallons oil would give 14,000 feet of 20-candle gas, etc. He stated these as facts, and refrained from advocating any special mode of oil-gas making.

In reply to numerous questions Mr. Patton stated that by a "ton of coal" he meant 2,240 lbs. That the oil was brought into contact with the red hot surface, by dropping it into the retorts. That he ascertained the quality of the gas, by using a one foot burner, and applying the photometric test. That the gas thus produced possessed five times the illuminating power of coal-gas. That he was not able to state what effect leakage would have on the result, as he tried to have as little leakage as possible. That he was not able to state the weight of the mixture he referred to in the paper, and that the price charged for the gas, and actually obtained, was $10 per thousand feet. Mr. Price stated that, in his opinion, poor coals could not be used profitably in the manufacture of gas. That a coal which was too poor to be used by itself, could not be made very valuable by the employment of enriching materials. Mr. Olney gave his experience in the use of coals, and Mr. Neal stated the results he had obtained from using one-third Lingan coal, mixed with Westmoreland and Youghiogheny. He thought Mr. Patton was mistaken about its being poor coal. Mr. Edgerton discussed at length the manufacture of gas from oil. Before he had finished, the President stated that Prof. Chandler's assistants desired as much time as possible to prepare for the lecture in the evening. He also read an invitation from several gentlemen, inviting the members of the Association to a dinner at the Hoffman House, on the following day, which was accepted, Mr. Nettleton read some tabular statements of results obtained at Utica, N. Y., by the Gwynne-Harris process and Lowe's patent, after which the meeting adjourned till 8 P. M., at which hour the members reassembled and listened with great interest to a very instructive lecture, from Prof. C. F. Chandler, of Columbia College, School of Mines, on "Gas," illustrating it with many beautiful experiments.

At 10 A. M., on the second day, the Association met according to adjournment.

The time for closing the discussion on naphtha gas having been fixed at 11 A. M., Mr. Edgerton continued his remarks, and a discussion followed which was joined in by Messrs. Allen, Price, Harbison, Neal, and others.

Mr. D. Bruce Peebles, of Edinburgh, Scotland, at the request of the Association, made an interesting statement, in regard to the manufacture of gas in England and Scotland, referring to the success that had been attained by Mr. Foulis with his mechanical stoker. A paper upon "Wooden pipes for Gas Mains," was read by Mr. Littlehales, of Canada, and discussed at length. Mr. Gerdenier, of Bridgeport. Conn., presented a paper on "Purification," which was followed by statements from various members as to their experience in this matter.

After the recess the subject of lime purification was further discussed, and after that the subject of Naphthaline. Mr. Edgerton then favored the members with an explanation and exhibition of an apparatus for "the correct analysis of gas," and also another "for determining the illuminating power of gas." Mr. Rowland explained his mechanical stoker, and invited all to come and see it at his works. An attempt to fix the place for the next annual meeting at Philadelphia, failed from a constitutional provision making New York the place. Mr. Price urged some very cogent reasons why Philadelphia, during the Centennial, would be an unfit place for a *business* meeting. If members wished to attend the Centennial, they could do so either before or after the business of the association was completed. It was decided that there should be no semi-annual meeting next Spring, and that the next annual meeting should be held in this city, in October.

A motion to appoint a committee of five to report at the next meeting, on "naphtha gas," was amended so that "the Committee of the Whole" should have charge of the matter, and adopted.

The value and utility of dry scrubbers for removing naphthaline, was discussed, and quite extended statements made as to the working of those in use in the Harlem Gas Works. After some minor business, the meeting was adjourned. And thus ended, with apparent satisfaction, to all, the 3d Annual Meeting of the American Gas-Light Association. We shall endeavor to give our readers so much of the verbatim reports of the proceedings as our space will allow in this, and following issues of the Journal, until the whole is completed. We have thus endeavored to give an outline of the proceedings, in order that those interested may form a general idea of the course of the different discussions. We trust that none of our readers will be satisfied with simply reading this outline; but that they will carefully study the *whole* of the discussions in order that if there are any points upon which they are in doubt, they may fix their attention upon them, and carefully observe, study, and collect facts relative thereto, and be prepared at the next meeting to give a fuller and more detailed expression of their conclusions. No doubt much disappointment was felt by many that the Naphtha Committee did not make a fuller report; but as the matter was referred to a committee of all the members for the next report, there certainly ought to be the fullest kind of a report therefrom. This question must be met fairly on its merits. It is a question of dollars and cents, and to no one more important than to the larger companies. If it can be shown that better gas, for less money, can be steadily, continuously and surely obtained by one method rather than another, they must in time adopt it in self-defence, and perhaps no one can blame them if bearing in mind the large interests they are responsible for, they do not adopt new courses of proceedure, until most fully satisfied, as to the *undoubted* utility and profit thereof. Much money has been and doubtless will continue to be spent in trying all sorts of ways to gain the great result. Not only this country but Europe is on the "qui vive" in this matter; but time alone must establish all changes. Sudden changes are always destructive. Let us then work together, slowly and surely, not taking anything for granted; but giving to every point its due weight, after a careful survey of the whole field, come to a sound and reliable conclusion. There is too much money involved in the gas-making of the world for prudent men to trifle with it. Perhaps while this investigation is going on, by a little study, the gas managers may find that a more rigid economy, a more careful administration, and a more scientific proceedure in their works, as at present constructed, may enable them to furnish their gas to their consumers at a less cost and of equal or better quality. Perhaps all do not get all they can as cheaply as they can. This is very important, especially where the competition of kerosene oil, at 20 or 25 cents a gallon, has to be combatted. There is no doubt but there is a demand on the part of consumers for cheaper light, and this demand must, as a matter of policy as well as justice, be met if possible. To what nobler end could the American Gas Light Association devote its energies than to this, to place within the reach of all a safe, healthy, clean, brilliant illuminating gas.

But one thing more remains to be mentioned, and "though last, it was not least" in pleasure. The Banquet provided by the generous hospitality of the gentlemen who extended the invitation to the members of the association, was one which doubtless will be long remembered. The elaborate *menu* was elegantly served, and everything that could be thought of or desired, was brought on in course after course. The President of the Association at the request of the gentlemen giving the entertainment, presided, while upon his right was Prof. Chandler, other members were seated at the different tables as circumstances happened to place them. After grace by the President all fell to work. The feast was worthy of the serious attention which it received. As the time wore on the speeches were in order; but this was a case when no reporters were present, and those of our readers who desire to know more of the many happy things that were said, will be obliged to inquire of some one who was there. Friends from at home and abroad joined in the fun, and some of the wit was as sparkling as the wine. Although it was not strictly "temperance" in all its parts, it was very "temperate; and it may be doubted if any festive board was ever more enjoyable in all respects than was that. It was our intention to use no names in connection with the account of the banquet, as we might err if we spoke from memory; but one incident we think will be remembered for many a year by all present, and that was the singing of "Auld Lang Syne," by our guest from Scotland; it was sung as none but a true Scotchman can sing it, with all that depth of feeling and sweet clearness of tone of which the good old tune is capable. We broke up at an *early* hour, and parted hoping to meet again.

We would most respectfully tender to the Association our sincere thanks for their many marks of consideration extended to the AMERICAN GAS-LIGHT JOURNAL during the meetings, and trust that the report that we shall give them of their proceedings will be satisfactory.

LIGHT!

It is proposed to give our readers a review of the accepted theories upon light. And while we claim no originality on a subject, which has occupied the minds of many of the most distinguished physicists not only in our own time, but in ages long since passed, still in restating the principles, which they have so carefully studied and often so beautifully illustrated, we would urge upon our readers a careful perusal of these fundamental truths and if in any thing that we state, they see aught to criticise, we hope they will, through our columns, unhesitatingly do so. What we desire is to provoke and promote honest discussion, for as we stated in our last issue we believe that practical common sense and a strict adherence to fundamental principles must result in good to all concerned. We will try in treating of this and other subjects to employ the simplest and plainest words possible, that he that reads may understand.

We would define light as follows: The principle by whose agency, we derive our sensations of external objects through the sense of sight, is called light.

All space is pervaded by an extremely attenuated, and highly elastic medium, which is called "ether," or by some writers the luminiferous ether.—While the sensations called sound, result from the action of the particles of the *atmosphere* in motion, upon the organ known as the ear, light is considered to be the result of the action of the particles of the *ether* in motion upon the organ called the eye. This ether is of so subtle a character that it permeates all things, even the atmosphere, and might be said to be the medium in which the atmosphere itself floats. Notwithstanding the very attenuated and subtle character of the medium, physicists have actually measured its motions and determined the laws that govern them and though unseen, yet it is known and discussed as really as though it were a ponderable body. As hinted above the sensations experienced are the result of *motion*, and that too the motion of the atoms and particles of this same medium called ether. Suppose an atom of ether to be displaced, or, in other words, moved by any cause—motion ensues—this first atom moves those adjoining it, and

they in their turn, set in motion others, and so on. The atoms themselves do not leave their own orbits, but they communicate their motion to their neighbors, and so on.—The orbits of each atom are always either circles, ellipses or straight lines and in the case of light the plane of these orbits is always at right angles to the line in which the light moves, or in other words to the ray of light. The combined motions of these atoms constitute what is termed a "wave."

The eye admitting the free passage of the waves of ether (for the ether pervades every thing) the sensation of sight arises from the motions communicated by these waves to certain nerves, spread over a portion of the interior of that organ.

All bodies are either self luminous or non luminous — but all the latter become self luminous, when their temperature is sufficiently elevated, or when in a state of chemical transition.—The self luminous bodies are seen in consequence of the light proceeding directly from them. The non-luminous are visible by means of reflected light, which they receive from some self-luminous body.—Light, then, is the result of motion. The light from any point of a visible object comes to the eye from that point in a straight line. We see a luminous object by means of the rays which each of its points sends to the eye. A small object that prevents our seeing a point of another object is always in a straight line from the eye to that point. A small hole in the window shutter of a darkened room admits the sun light in a narrow beam, which marks its course on the particles of dust, floating in the atmosphere, and this beam is perfectly straight.

The velocity of the waves of light in a homogeneous medium is *always constant* and has been determined by different investigators.

Roemer made it 192,500 miles per second; and others have made it differently, varying from 184,177 to 194,677 miles per second.

Sir John Herschel says that "a cannon ball would require 17 years to reach the Sun, yet light travels over the same space in 8 minutes.," "It is demonstrable that light can not reach our system from the nearest fixed star in less than five years."

But do return to our wave motion.

The motion to and fro, in its orbit, of each atom is called its displacement, upon the amount of this displacement depends the intensity of light. The rise and fall so to speak of the waves, that is the distance from the top of the crest to the bottom of the furrow, is the algebraic sum of the displacements of the atoms in a wave length and is sometimes called the *amplitude*. The intensity of light is inversely as the square of the distance. Now the *particles* of ether describe their orbits in equal times, hence the greatest displacement (or the largest orbits) must result from the greatest velocities. And as the intensity varies with the square of the velocity, it must vary with the square of the displacements, that in a wave of light we have this *important* law. The intensity of light varies as the *square* of the *amplitude*. This is very important as from it we see that intensity or candle power of gas light varies as the square of the volume of the gas consumed, supposing combustion to be perfect. Now it is well known that *perfect combustion* is difficult to secure, and variations from absolute compliance with this rule may occur, but they are not sufficient to affect its correctness But what is wanted both for the manufacturer and consumer of gas is a more perfect *burner*, so that the full illuminating power may be developed. In speaking upon the subject of Combustion at some future day, we may refer to this matter again. The result of the above rule is that one six foot burner (combustion being perfect) will give four times as much light as a three foot burner and that two 3 ft burners, burning separatly, will not give the same light as one 6 ft burner. Hence it is better to concentrate the volume of gas consumed in large burners.

[To be continued.]

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November 2, 1875.

☞ All communications will receive particular attention

	Capital.	Par.	Bid.	Asked.
Gas. Co.'s of N. Y. City.				
Harlem	$1,850,000	50	135	136
Manhattan	4,000,000	50	310	317½
Metropolitan	2,500,000	100	160	165
" Scrip		...	106	...
Mutual	5,000,000	100	107	108
New York	4,000,000	100	152	155
Westchester	466,000	50	100	105
Gas Co.'s of Brooklyn.				
Brooklyn	2,000,000	25	250	...
Citizens	1,200,000	20	153	156
" Scrip		...	101	...
Peoples	1,000,000	10	100	105
" Bonds		...	98	...
" Scrip		...	102½	...
Metropolitan	1,000,000	100	107	116
Nassau	1,000,000	25	134	...
Williamsburgh	1,000,000	50	147	...
" Scrip		...	102	...
Out of Town Gas Companies.				
Buffalo Mutual, N. Y	750,000	100	50	50
Baltimore, Md	2,000,000	100	190	...
Brockport, N. Y	25,000	...	...	90
Citizens, Newark	500,000	...	...	55
Derby of Conn	160,000	100	...	80
East Boston, Mass		25	112	115
Hannibal, Mo	100,000	100	90	...
Hartford, Conn	700,000	25	41	43
Hempstead, L	40,000	100	...	100
Jersey City	386,000	...	160	...
Jamaica, L. I	25,000	100	...	100
Lewistown, Maine	400,000	100	...	80
Peoples, Jersey City		...	130	...
Peoples of Albany	1,000,000	100	45	...
Peoples of Baltimore		25	108	...
Rochester, N. Y		100	50	...
Fort Wayne, Ind		100	...	105
Woonsocket, R. I	150,000	100	100	...
Lima, Ohio	30,000	100	10	...

PRICES OF FOREIGN AND DOMESTIC GAS COALS.

[Reported Expressly for this Journal.]

November 9, 1875.

DELIVERED IN NEW YORK.

English Cannel.			
Ince Hall	$17 00	@	18 00
Kirkless Hall	16 50	@	17 00
English Caking Coals.			
Newcastle Gas	$5 75	@	00 00
Liverpool caking	11 50	@	12 00
British Province Coals.			
Pictou			2 25
Block House—At Mines, $1.87, Gold			0 00
Caledonia—At Mines, $1.75, Gold			0 00
Little Glace Bay—At Mines, $1.75, Gold			2 00
Lingan—At Mines, $1.75, Gold			0 00
Sydney—Old Mine			3 00
" Reserve, $1.75, Gold Mine			2 25
" International			— —

(Duty, 15 cents per ton, gold. Freight to New York $2 25 currency. Cost of above coals delivered in New York, $5 25 @ $6 00⅛, currency.)

Pennsylvania Coals.			
Penn Gas Coal—At Amboy	$6 10	@	0 00
Westmoreland—At Amboy	6 10	@	0 00
(In New York both the above coals $6 50)			
Shafton	6 50	@	0 00
Youghiogheny	6 50	@	0 00
West Virginia Coals.			
Murphy Run	$6 50	@	0 00
Despard	6 50	@	0 00
West Fairmont	6 50	@	0 00
American Gas Coal	7 40	@	0 00
Fairmont	6 50	@	0 00
Newburgh Orrel	6 50	@	0 00
Pinnickinick	6 50	@	0 00
Cloverhill of Virginia	6 00	@	6 50
McKenzie Compound Mixture			— —
American Cannel Coals.			
Peytona of West Virginia	$12 50	@	00 00
Darlington of Pennsylvania			— —
Canneiton Cannel			11 00
Red Bank—at Philadelphia			6 50
" —at South Amboy			7 25
Asphalts.			
Albertite of New Brunswick	$— 00	@	— 00
Ritchie Mineral of West Virginia	18 00	at Balt'e.	
Trinidad Bitumen	— —	@	14 05

The Penn Gas Coal Company have contracted with the Pittsburgh Gas-Light Co. for their entire supply for the ensuing year from their Youghiogheny mines.

Advertisers Index.

☞ In looking for advertisements, see figures 1 to 12, within brackets, at head of advertisement pages.

GAS BURNERS, APPARATUS, ETC.

American Meter Co.—West 22nd st., N. Y., Arch and 22d st., Phil., 548 Washington st., Boston....11
Cast Iron Gas and Water Pipe—S. Decatur Smith, York and Moyer streets, Phila., Pa....6
Cast Iron Gas and Water Pipes—R. D. Wood & Co., Philadelphia Pa....10
Cast Iron Gas and Water Pipe—Jno. McNeal & Sons, Burlington, N. J....8
Franklin Foundry and Pipe Works—Jas. Marshall & Co., 23 Nineteenth street, Pittsburgh, Pa....2
Gas Valves (Chapman) 75 and 77 Kilby st., Boston, Mass....3
Gas-Burners—C. Gefrorer, 248 North 9th st., Phila., Pa....9
Gas Purification—St. John and Cartwright....5
Gas Meters, etc.—Harris, Griffin & Co., 12th and Brown streets, Phila., Pa....10
Gas Meters, etc.—Wm. W. Goodwin & Company, 1012 Filbert street, Phila, Pa....17
Gas Meter Manufacturers—Harris & Bro., 1117 Cherry st., Philadelphia, Pa....11
Gas Fixtures, Etc.—Mitchell, Vance & Co., 597 Broadway....7
Gasholders, Etc.—Deily & Fowler, 39 Laurel st., Phila., Pa....4
Gas Screen—James P. Mahon, Boston, Mass....5
Gas Engineer—Henry Cartwright, Phil. Pa....4
Lime Hurdles.—Manhattan Lime Hurdle Co., Geo. W. Day, Treas., No. 3 Railroad Square, Haverhill, Mass....2
Lava Tips and Scotch Tips—Charles H. Meyer & Co., 227 Chestnut street, Phil. Pa....8
National Tube Works Co., 78 William St., N. Y....7
Patent Conically Slotted Wood Trays—John L. Cheesman, 147 and 149 Avenue C., N. Y....4
Patent Gas Exhauster—Smith & Sayre, 95 Liberty street....4
Pelouze & Audouin Condenser—Jas. R. Smedberg, Sole Agent for U. S. San Francisco, Cal.; Henry Cartwright, 2107 Green street, Phil. Pa....1
Petroleum Gas—J. D. Patton, Treverton, Pa....4
Patent Gas Exhauster—S. S. Townsend, Agt., 31 Liberty street, N. Y....3

GAS COALS

Cannelton Coal Co. of West Virginia—J. Tatnall Lea, 325 Chestnut street, Phila, Pa....3
Despard Coal Co.—Parmelee & Bros., Agents, 32 Pine st., New York....7
Gas Coals—Bird, Perkins & Job, 27 South st., N. Y....7
Monongahela Gas Coal—56 Exchange Place, Baltimore, Md. 6
New York and Cleveland Gas Coal Company—384 Penn Avenue, Pittsburgh, Pa....6
Ohio Gas Cannel—G. Merryweather, Pine cor. Wm. sts.
Penn Gas Coal Co.—11 Merchants' Exchange, Phil. and 90 Wall street, N. Y....6
Peytona Cannel Coal—S. E. Low, 58 Broadway, N. Y....5
The Newburg Orrel Coal Co.—Chas. W. Hays, Agent in New York, Trinity Building, 111 B'way, Room 7....6
Tyrconnell Gas Coal—52 S. Gay Street, Baltimore, Md....6
Westmoreland Coal Co.—230 South 3rd Street, Phil. Pa....
Youghiogheny Coal—Perkins & Job, 27 South St. N. Y....7

FOUNDRIES.

Atlantic Dock Iron Works—John P. Kennedy, Office 98 Liberty street, N. Y., P. O. Box 2348....
Cast-Iron Pipes and Fittings—B. S. Benson, 52 East Monument street, Baltimore, Md....
Continental Works—T. F. Rowland, Greenpoint....6
Camden Iron Works, Camden, N. J.—Jesse W. Starr & Son.
Gloucester Iron Works—J. P. Michelion, Sec., 6 North 7th street, Phila., Pa....4
Mill Street Foundry.—Geo. Stacey & Co., Cincinnati, O....5
National Foundry and Pipe Works—Wm. Smith, Carroll, Pike, Smallman & Wilkins streets, Pittsburg, Pa....
Oregon Iron Foundry—Herring & Floyd, 740 Greenwich street, N. Y....10
Pascal Iron Works—Morris, Taskar & Co., Philaelphia....12
Providence Steam and Gas Pipe Co., Providence, R. I.—H. A. Branch, Agent....3

WATER METERS, PUMPS, ETC.

Cast Iron Pipes for Water and Gas—Riley A. Brick, 112 Leonard street, N. Y....10
Valves for Water, Steam and Gas—Ludlow Valve Man'g Co., 940 River street, Troy, N. Y....6
Water Pipes, etc.—S. Fulton & Co., 412 Walnut st., Phila....7

CLAY RETORT WORKS.

B. Kreischer & Son, Clay Retorts, etc., 58 Goerck st., N. Y. 8
Cheltenham Fire Brick and Clay Retort Works—Evens & Howard, 916 Market street, St. Louis, Mo....
Manhattan Clay Retort Works, 15th st., near Av. C, N. Y....8
Philadelphia Fire Brick Works, Vine and 23d sts., Phila....8

LAMPS, STOVES, PETROLEUM, ETC.

Lamps—M. B. Dyott, 114 South 2nd Street, Phil. Pa....1
Patent Lamp Post—J. W. Graham, Chillicothe, Ohio, or A. M. Callender, office of this Journal....9

MISCELLANEOUS.

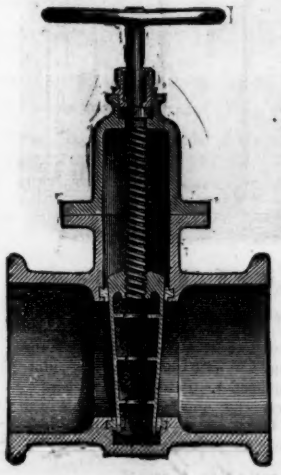
Analysis and Testing of Gas Coals—Prof. Henry Wurtz, 12 Hudson Torrace, Hoboken, N. J....10
Architect and General Gas Engineer—William Farmer, 111 Broadway Room 95, N. Y....
Brass Cocks, Plumbers' Materials, etc., etc.—McNab & Harlin Manufacturing Co., 56 John st., N. Y....7
Cements—S. L. Merchant & Company, 76 South st., N. Y....
Contractors for Gas Works, Etc.—Murray & Baker, Fort Wayne, Ind....2
Fodell's System of Bookeeping—A. M. Callender & Co., 42 Pine st., New York....1
Gas Engineer—B. S. Chollar, 914 Olive St., St. Louis, Mo....
Gas-Light Company of America, 63 and 64 Drexel Building, New York....2
Kidd's Gas Consumers Guide—A. M. Callender & Co., 42 Pine Street, N. Y....
Massachusetts Institute of Technology—Samuel Kneeland Boston, Mass....
National Coal Gas Company—H. P. Allen, 4 Warren street New York....6
School of Mines, Columbia College, East 49th st....9
Screening Shovels—Herring & Floyd, 740 Greenwich st., New York....7
Scientific and Practical Chemist and Geologist—Profetsor Henry Wurtz, 12 Hudson Terrace, N. J....
Screening Shovels—G. W. Dean, 1358 Broadway, N. Y....
Springfield Gas Machine—Corner Canal and Centre St....
Slade's Automatic Fire Governor—Jas. Slade, Gas Works, Yonkers, N. Y....

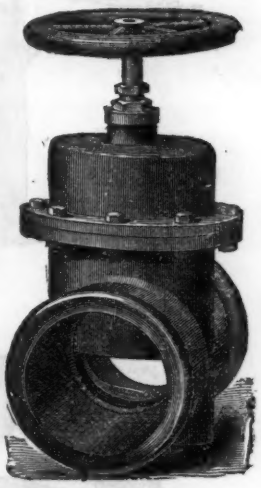
CHAPMAN VALVE MANUFACTURING CO.

MANUFACTURERS OF

CHAPMAN GAS VALVES.

Office and Sales Room 75 and 77 Kilby Street, Boston.





These Valves have been in use for several years, and are pronounced by all who have used them to be

The Best Gas Valves Ever Made.

They afford a direct passage the full size of the pipe. The seats are made of an alloy similar to BABBITT metal, specially prepared for the purpose, and superior to all other metals used for the seats of Gas Valves. It does not corrode under any circumstances to which it is exposed.

There is no LIABILITY OF COHESION between the Gate and Seat, and the Valves can be relied upon to SHUT TIGHT and OPEN EASILY at all times—an important desideratum when used for street mains, in cases of fire.

We refer to the following named Gas-Light Companies among the many that have used these Valves:

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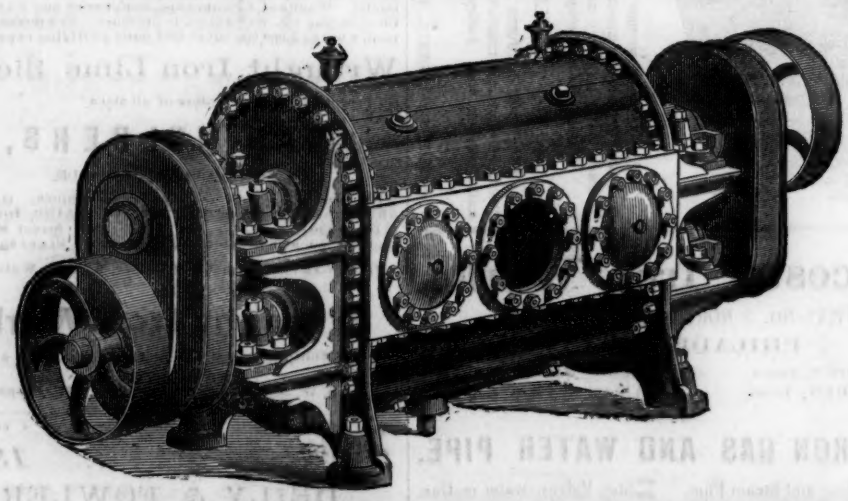
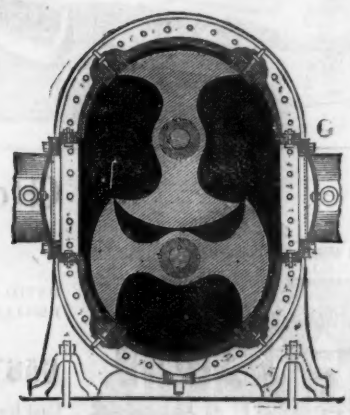
CAMBRIDGE GAS-LIGHT COMPANY, CAMBRIDGE, MASS.
NEWTON & WATERTOWN GAS-LIGHT CO., WATERTOWN, MASS.
LAWRENCE GAS-LIGHT COMPANY, LAWRENCE, MASS.
PEOPLES GAS-LIGHT COMPANY, BROOKLYN, N. Y.
CITIZENS GAS-LIGHT COMPANY, BROOKLYN, N. Y.
SOUTH BOSTON GAS-LIGHT COMPANY, BOSTON, MASS.
CHARLESTOWN GAS-LIGHT CO., CHARLESTOWN, MASS.
LYNN GAS-LIGHT COMPANY, LYNN, MASS.
FITCHBURG GAS-LIGHT COMPANY, FITCHBURG, MASS.
CITIZENS GAS-LIGHT COMPANY, NEWARK, N. J.
WILLIAMSBURGH GAS-LIGHT CO., WIRLIAMSBURGH, N. Y.

GAS AND WATER VALVES ½ INCH TO 36 INCHES DIAMETER.
STEAM VALVES ½ INCH TO 12 INCHES DIAMETER.

357-tf

PATENT IMPROVED GAS EXHAUSTER.





P. H. & F. M. ROOTS, PATENTEES AND MANUFACTURERS, CONNERSVILLE, IND.

S. S. TOWNSEND, GENERAL AGENT, 31 LIBERTY STREET, NEW YORK.

The following are some of the advantages we claim for this Exhauster over all others:

FIRST.—It is simpler in its mechanical construction than any other Exhauster in use.

SECOND.—The internal parts consist of only two revolvers, each cast entire in one piece, without a single screw, bolt, nut, washer, key, or other part to get loose on the inside and stop or break the machine. The internal operating parts, therefore, can not get out order, and hence require no care or attention.

THIRD.—Every part of the machine requiring care or attention, as the journals, gearing, etc., is external, easily observed and attended to. All changes, adjustments, and repairs are made from the outside. The journal bearings, if necessary, can be renewed in a few minutes.

FOURTH.—The internal operating parts are practically gas-tight, but are not in actual contact, hence there is no internal friction or wear. The machine is therefore operated with less power than any other.

FIFTH.—They are built in the most complete and substantial manner, with steel shafts and improved journal bearings, and their durability is almost without limit.

We build them of any required capacity, large or small, adapted to any kind of works or place.

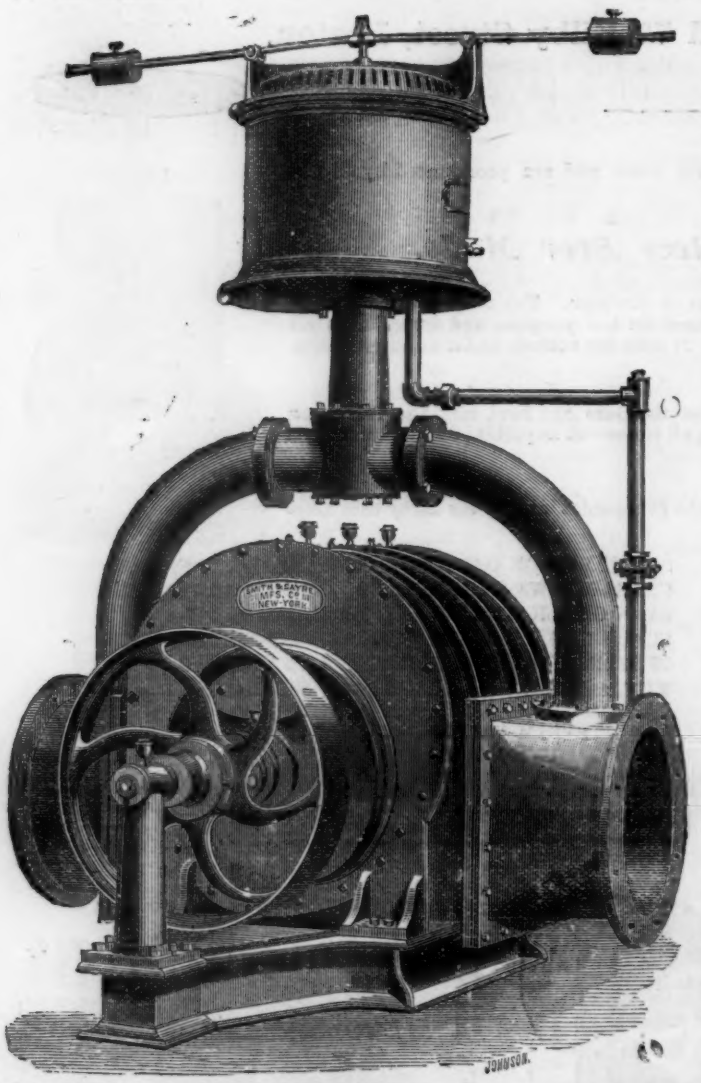
Send for Illustrated Catalogue, giving all particulars as to capacity, speed, power required, dimensions, and price of each size, and references to parties using them.

P. H. & F. M. ROOTS.

SMITH & SAYRE MANUFACTURING COMPANY.

The Mackenzie Patent Gas Exhauster

And Patent Compensator.



They are made to pass from 4,000 to 150,000 cubic feet of gas per hour; will increase the production and illuminating power of the gas, and add very much to the durability of the retorts, either clay or iron. The Compensator obviates entirely the necessity of water-jo ints, is compact, durable, cleanly, not liable to get out of order, self-acting, quiet, and certain in its operation.

We are also sole proprietors and manufacturers of the

MACKENZIE PATENT BLOWER, PATENT CUPOLA AND SMELTING FURNACE.

The Blower is a Force Blast machine, durably built, and can be driven with one-third the power required to drive the ordinary fan.

The Cupolas are manufactured in sizes to melt from 1 to 20 tons per hour, will save one quarter of the time required by the old style Cupola and 33 per cent fuel. Address

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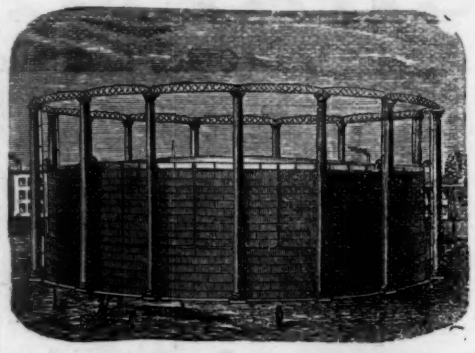
Continental Works,

GREENPOINT, BROOKLYN, N. Y.

ENGINEER, AND MANUFACTURERS OF



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OF ANY MAGNITUDE,

Condensers, Scrubbers, Purifiers, Retorts, Hydraulic Mains and all other articles connected with the Manufacture and Distribution of Gas, furnished with despatch. Plans and Specifications prepared, and Proposals given for the necessary Plans for Lighting Cities, Towns, Mansions, and Manufactories.

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Camden, New Jersey,

Office in Philadelphia No. 435 Chestnut St., where a member of the Firm can be seen between 12 m. and 2 p. m. daily.

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ALL KINDS OF CASTINGS AND APPARATUS FOR GAS WORKS,

Wrought Iron Roof Frames,

For Retort and other houses Retorts and all castings required for setting them in the latest and most improved model. WASHERS, CONDENSERS, SCRUBBERS and EXHAUSTERS for relieving the Retorts from pressure. PURIFIERS, varying from 2,000 to 2,000,000 cubic feet daily purifying capacity.

Wrought Iron Lime Sieves

for Purifiers. Station Meters of all sizes.

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TELESCOPIC AND SINGLE,

With cast iron guide and suspension frames. GAS GOVERNORS or REGULATORS, STREET MAINS, from 1½ to 48 INCHES DIAMETER, for WATER or GAS. Street Main connections, such as BRANCHES, BENDS, DRIPS, SLEEVES, etc.

STOP VALVES, from 3 to 30 inches, for both Water and Gas.

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All the Smith and Sheet Iron work required in and about Gas Works. 226-tf

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Cast Iron Heating and Steam Pipe. Stop Valves. water or Gas.

Fire Hydrants,

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1842. *1875.*

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Particular attention paid to Extensions and Repairs.

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Gas Tile, Drain Pipe, Fine Ground Fire Clay, &c.

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MINED IN TAYLOR COUNTY, WEST VA.

Company's Office, 52 S. Gay St., Baltimore.

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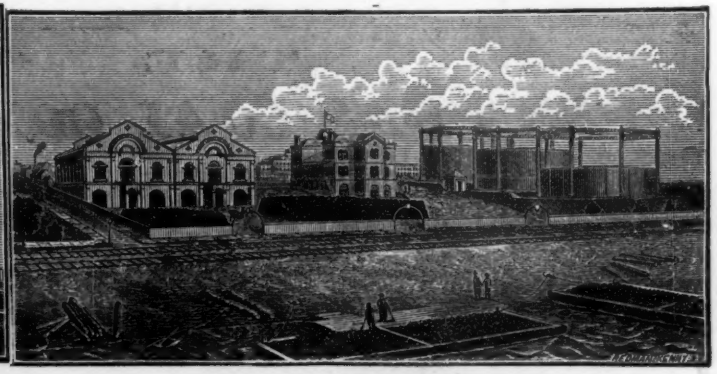
This coal yields 10,000 cubic feet of Gas, with an illuminating power of over 16 candles. Forty bushels very superio Coke, with little Ash, and scarcely any clinker. 04-1y

CINCINNATI GAS WORKS. ERECTED 1871-72-73.—WM FARMER, Eng.



LACLEDE GAS WORKS, ERECTED 1872.—WM. FARMER, Eng

WILLIAM FARMER,

ARCHITECT AND GENERAL GAS ENGINEER,

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WILLIAM FARMER may be consulted upon all matters connected with the construction of GAS WORKS, or any other description of buildings. Will furnish General and Detail Drawings, Specifications and Estimates for Gas Works of any capacity.

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Exhausters for Gas and Foul Lime Ventilation,
Dumping Barrows for Coal, Coke and Lime,
Hydraulic Mains for Retort Benches,
Blowers for Forges, Foundries, &c.
Pumps for Water, &c., &c.

REFERENCES:

Professor SILLIMAN, New Haven, Conn.
GEN. CHAS. ROOME, President Manhattan Gas-Light Company, N. Y.
A. W. BENSON, President Brooklyn Gas-Light Company, Brooklyn, N. Y.
W. W. SCARBOROUGH, President Cincinnati Gas-Light Company, Cincinnati, Ohio.
S. L. HUSTED, President Laclede Gas-Light Company, St. Louis, Mo.
Prof. HENRY WURTZ, 12 Hudson Terrace, Hoboken, New Jersey.
GEN. A. HICKENLOOPER, Vice-President Cincinnati Gas-Light Co., Cincinnati, Ohio
FREDERICK CROMWELL, Vice-President Laclede Gas-Light Company. St. Louis Mo.
C. VANDERVOORT SMITH, Engineer Manhattan Gas-Light Company, N. Y.
JAMES R. SMEDBERG, Consulting Engineer, San Francisco Gas-Light Co., Cal.

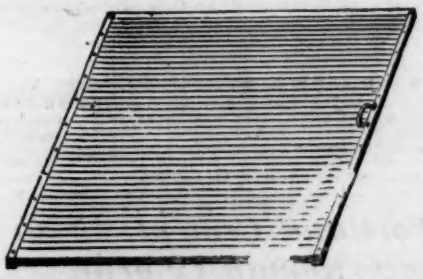
To Gas Companies.

CHEESMAN'S

CONICALLY AND DIAMOND SLOTTED

SOLID WOOD TRAYS.

PATENTED OCTOBER 21, 1862 AND JUNE 10, 1873.



The above Trays are made from half inch to one and a quarter inch thick with a strong centre piece, bars bevelled on top. Also the Diamond Bar Tray can be used either side up; smoothest and most durable Trays in use. They are now used by more than three hundred Gas Companie in the United States and other places.

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151 and 153 Avenue C, New York.

GEO. W. DRESSER,

CIVIL ENGINEER.

TRINITY BUILDING,
ROOM 93. 111 BROADWAY.

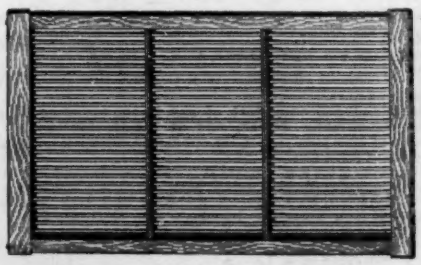
DUFFEE'S IMPROVED

GAS SCREEN,

OFFICE 19 *TREMONT ROW, ROOM* 5,
BOSTON, MASS.

JAMES P. MAHAN, Treasurer.
Manufactory at Haverhill, Mass.

E. DUFFEE, Agent,
Formerly with AMERICAN GAS SCREEN Co.,
Haverhill, Mass.



The Screen is made with an ash or oak frame, perforated with ROUND RATTANS, turned and reeved through, drawing the frame firmly together, strengthening it *without the use of nails or rivets.*

This Screen is reversible, can be used either side up, gives a large purifying capacity; there is no clogging by foul lime, as the rattan presents a smooth surface and can be cleaned very easily. It is considered by all Gas Engineers who have used it to be the best Screen now in use.

☞ **Samples sent Free to all Parts of the United States.**

All communications should be addressed to

JAMES P. MAHAN,
19 Tremont Row, Room 5.
Boston, Mass.

384-6t

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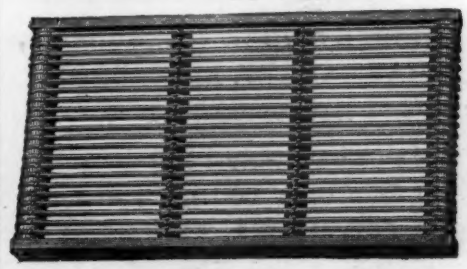
LIME HURDLES

after a practical trial have been adopted by over thirty Gas-Light Companies *the last season*, some of them the largest in the country.

They are LIGHT, STRONG and DURABLE, made *with Ash frame* and *round flexible Rattans.*



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HAVERHILL, MASS.

J. L. BLAISDELL, President.
GEORGE W. DAY, Treasurer. 389

GAS FITTERS, PULMBERS, STEAM FITTHRS, ENGINEERS, MACHINISTS, Apprentices. and Gas Consumers, should all read the

GAS FITTERS and PLUMBERS GUIDE.

Price 50 and 75 cents. Sold only by the author and publisher.

S. D. GALLOWAY,
345 North 10th Street, Philadelphia.

GAS COALS.

THE
PENN GAS COAL COMPANY

OFFER THEIR

COAL, CAREFULLY SCREENED,

AND PREPARED FOR

GAS PURPOSES.

Their Property is located in the Youghiogheny Coal Basin, near Irwin's and Penn Station, on the Pennsylvania Railroad, and on the Youghiogheny River.

OFFICES

No. 11 Merchants Exchange, Phil'a. 90 Wall Street, New York.

PLACES OF SHIPMENT.

Pennsylvania Railroad, Pier No. 2 (Lower Side).
Greenwich Wharves, Delaware River.
366-1y **Pier No. 1 (Lower Side), South Amboy, N. J.**

CANNELTON COAL CO.

OF WEST VIRGINIA.

Offer for sale the following Coals, from their Colliery at CANNELTON, Kanawha County, West Virginia, delivered at RICHMOND, Va.:

CANNELTON CANNEL,

cknowledged to be the most valuable ENRICHER produced in this country, a gross ton yielding 10,000 ubic feet of GAS of 64·54 CANDLE POWER; COKE 32 bushels, of good quality.

CANNELTON CAKING COAL.

Volatile Matter.	Coke.	Per cent. of Ash in		Sulphur in			Specif. Gravity.	
		Coal.	Coke.	Coke.	Oötl.	Volatile Matter.	Coal.	Gas.
35.1	64.9	2	6	.82	1.48	.66	1.289	.476

MAXIMUM YIELD, 5.06 cubic feet of Gas per pound of Coal—A yield of 4·78 cubic feet per lb.—gave 16 14-100 Candle-Power.

COKE, of very fine quality—1453 pounds produced from one ton of coal.

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Analyses and Prices of all the principal SCOTCH CANNEL COALS will be forwarded on application. 329-1y

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Orrel Coal Company,

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This Company offer their very superior Gas Coal at lowest market prices.

It yields 10,996 cubic feet of gas to the ton of 2,240 lbs. of good illuminating power, and of remarkable purity; one bushel of lime purifying 6,792 cubic feet, with a large amount of coke of good quality.

It has been for many years very extensively used by various Gas Companies in the United States, and we beg to refer to the Manhattan, Metropolitan, and New York Gas Light Companies of New York; the Brooklyn and Citizen's Gas Light Companies of Brooklyn, N. Y.; the Baltimore Gas Light Company of Baltimore, Md., and the Providence Gas Light Company, Providence, R. I.

The best dry coals shipped, and the promptest attention given to orders. 224-1y

THE DESPARD COAL COMPANY

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DESPARD COAL

To Gas Light Companies throughout the country.

Agents, PARMELEE BROTHERS, No. 32 Pine street, N. Y.
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Mines in Harrison County, West Virginia.
Wharves Locust Point, } Baltimore.
Company's Office, 29 South street, }

Among the consumers of Despard Coal, we name: Manhattan Gas Light Company, New York; Metropolitan Gas Light Company, New York; Jersey City Gas Light Company, N. J.; Washington Gas Light Company; Portland Gas Light Company, Maine.

*** Reference to them is requested. 204-1y

NEW YORK AND CLEVELAND

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Of Pittsburgh, Pa.

MINERS AND SHIPPERS OF

YOUGHIOGHENY GAS COAL.

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This process has been fully tested nearly 50,000,000 cubic feet of Gas having been made under it, and fully demonstrating the fact that it is the greatest improvement ever made in the manufacture of Gas, either for Lighting or Heating purposes. With half a ton of Anthracite Coal 150,000 cubic feet of Gas per day is made from three benches, and the labor is so small that one man can attend three or four benches.

The process can be put into either Coal or Oil Gas Works (or where both Coal and Oil are used) at small cost, without any interruption to the working of other benches. The Citizens Gas-Light Company of Brooklyn, after using it for more than seven months, have found it not only far better, but actually *cheaper* than atmospheric air in making Gas, with the use of "petroleum and its products."

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Portland Cement,
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NUMBERS 1 AND 2.

From best London Manufacturers.

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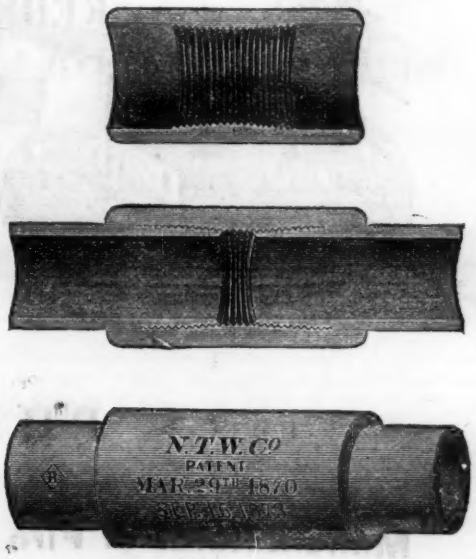

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from their Colliery at Smith's Mills, on the Youghiogheny River, thirty-seven and a half miles southerly of Pittsburgh. This Coal has the preference in Pittsburgh over all other YOUGHIOGHENY COAL for GAS PURPOSES.

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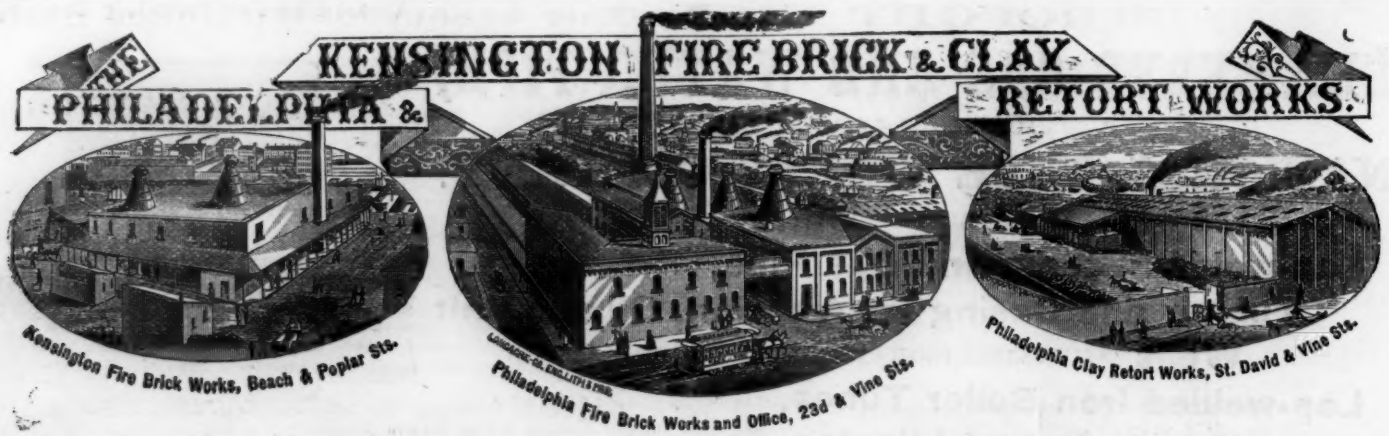
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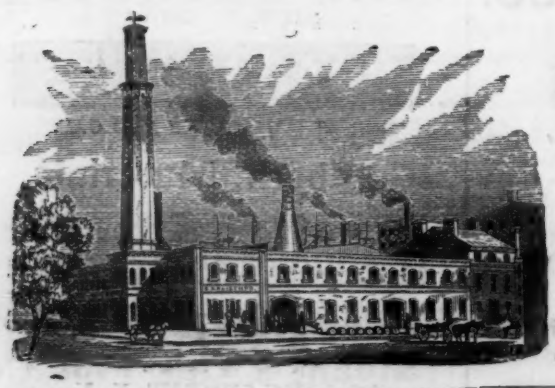

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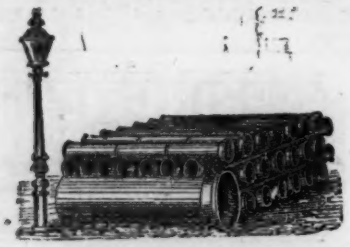

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The Company respectfully refer to Companies using these processes in this city, Brooklyn, Newark, Chicago and elsewhere, and especially to the Mutual Gas-Light Company of Detroit, Mich., whose works more nearly conform in all details of construction to the original plans of the inventors, thanth ore of other Companies.

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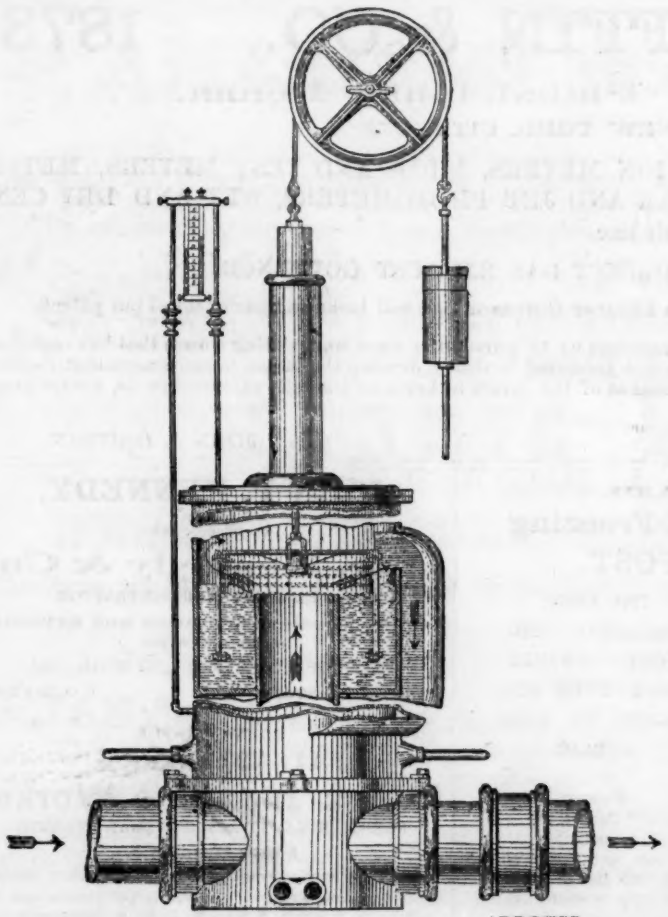

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Sole Agency for the United States.

THE

Pelouze & Audouin Condenser.

PATENT MAY 26, 1874.

With SMEDBERG'S COMBINED BYE-PASS, REVERSED FLOW, and DIFFERENTIAL GAUGE.

PATENT JULY 21, 1874.

This apparatus is based upon the recent discovery by Messrs. PELOUZE & AUDOUIN of the principle of Condensation by impact, or percussion.

All gas-makers are aware how difficult it is to separate all the Coal Tar and Water from Crude Coal Gas by mere cooling; and how frequently these liquids are swept on to the purifiers, even where scrubbers or washers of large size and considerable cost are employed.

The PELOUZE & AUDOUIN CONDENSER completely arrests these by-products, increasing the quantity of Coal Tar available for fuel or sale, reducing the tendency of the purifying material to cake on the trays, and yielding a gas-liquor of remarkable strength. Hence, all the processes of purification are facilitated, while its simultaneous arrest of heavy percentages of Naphthaline reduces the risk of stoppages to a minimum.

The subordinate patent of July 21, 1874, combines a Bypass with the Condenser; and thus saves to the purchaser the cost and slow action of three valves, together with the space occupied by these valves and the necessary connections.

The Differential Gauge is so constructed that there is no oscillation of its water-columns; while it indicates inlet pressure, outer pressure, or back-pressure, at the will of the observer.

IT IS POSITIVELY GUARANTEED THAT EVERY CONDENSER SHALL BE OF PERFECT MECHANICAL CONSTRUCTION, AND SHALL DISCHARGE ITS FUNCTIONS SATISFACTORILY.

The Condensers are now used or ordered by the following American Gas Works: San Francisco, Cal. (3); Louisville, Ky. (2); Oakland, Cal. (1); New Orleans, La. (1); Salt Lake City, Utah (2); Philadelphia, Pa. (1); Newark, Ohio (1); Indianapolis Gas Company.

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Has purified, per bushel, on a single test, 10,000 feet of Westmoreland Gas. With revivification lasts indefinitely. Surpasses in POWER and ECONOMY all known materials. Saves largely in FIRST COST, SPACE, LABOR, SUPERINTENDENCE, and all current expenses. Will purify *easily* sulphurous gas, wholly *unmanageable by lime.* Takes out *all the ammonia.* Now operating in the following Gas Works: Harlem' New York (21st street); Port Morris; Hunter's Point; East New York Worcester, Lynn and Cambridge, Mass.; Lewiston, Maine; St, Albans, Vt.; Pawtucket, R. I.; Meriden, Ct., and being introduced in many other places.

Cost 70 cents per bushel. One bushel for each square foot of Purifier sufficient. Rights to use for life of Patents, for daily makes of gas in thousands; under 25,000 $200; under 50,000, $400; under 100,000, $500 $250 additional for each additional 50,000 per day.

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The support and confidence of Gas Companies, so long enjoyed by us, encourage us to pursue the same undeviating course that has contributed to establish the character of our house, and with our extended experience and increased facilities, develop the latest improvement that Science can apply, in the construction of Gas Meters, etc., and thereby merit a continuance of the favors hitherto so liberally extended to us, always guaranteeing satisfaction.

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for relieving Retorts from pressure.

BENDS and BRANCHES
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MALLEABLE RETORT LID.

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FURNACE DOOR AND FRAME.

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or stopping leaks in Retorts.

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Gas Consumers' Guide

Enables every Gas Consumer to ascertain at a glance, without any previous knowledge of the Gas Meter, the quantity and money value of the Gas consumed. Also the best method of obtaining from Gas the largest amount of its light.

It will be to the advantage of Gas Companies to supply their Consumers with one of these Guides, as a means of preventing complaints arising from their want of knowledge in regard to the registration of their meters. For sale by

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Patent Anti-Freezing LAMP POST.

THE BEST, CHEAPEST AND MOST DURABLE POST EVER OFFERED TO THE PUBLIC.

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Yours truly,
LUCAS FLATTERY
Sec'y Wooster Gas-Light Co.

Address the Patentee,
J. W. GRAHAM,
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HYDRAULIC MAIN DIP REGULATORS.

ALSO

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For the Erection, Alteration and Extension of Gas Works.

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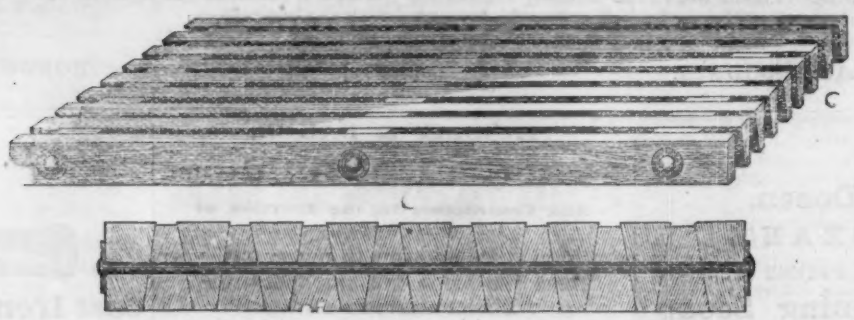

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